

























TZ  
501  
A552  
M4SM  
V 14  
No 1-11  
Jan-March  
1918

JAN 2. 1918

SPECIAL NAVAL ISSUE

# AEROPLANE

WEDNESDAY, JAN. 2. 1918

Edited by  
C. G. Grey

Vol. XIV, No. 1

THREEPENCE WEEKLY

[Registered at the G.P.O.  
as a Newspaper.]

## THE NORMAN THOMPSON FLIGHT CO. Ltd.

ESTABLISHED 1909

Telegrams—SOARING, BOGNOR  
ENTIFLYTE CHARLES, LONDON

Works—MIDDLETON, BOGNOR

Telephones—BOGNOR 48. GERRARD 7385

CONTRACTORS TO THE ADMIRALTY

London Office—  
DEWAR HOUSE, 11, HAYMARKET, S.W.1.

DESIGNERS AND MANUFACTURERS OF FLYING BOATS AND LAND PLANES

**Auster** **Aero-shields**  
LONDON. BIRMINGHAM

SMITHSONIAN  
FOR  
LIBRARIES

**BEARDMORE** **AERO**  
**ENGINES**

**TITANINE**  
**NON-POISONOUS**  
**DOPE**

SEE ADVERT: INSIDE.

**ACCLES & POLLOCK, LTD.**

WELDLESS STEEL TUBES — OLDBURY, BIRMINGHAM.

**TRIPLEX** Safety **GLASS**

See Advt inside



**11, Victoria Street, London, S.W.1.**

**J. E. HUSON, Managing Director.**

**Telephone: Victoria—5078, 4210**

**Telegrams: Entikosil, Vle. London.**

**SILVER SPRUCE**

**ASH**

**WEST VIRGINIAN SPRUCE**

**WALNUT**

**MAHOGANY**

**GLASGOW:**

**67, HOPE STREET.**

**Telephone: Central 3273.**

**Telegraphic Address: Entikosil, Glasgow.**

**PARIS AGENCY:**

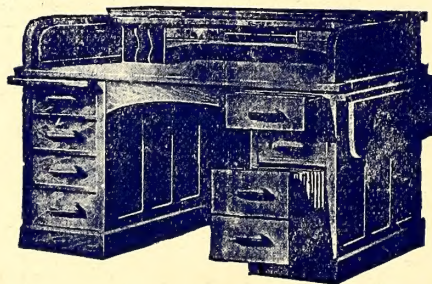
**5, RUE NOUVELLE, PARIS.**

# Factory & Office Furniture

**LARGEST STOCK FOR IMMEDIATE DELIVERY.**

**(NEW AND SECOND-HAND)**

**SPECIALITÉ**



**SAFES.**

**COOKE'S (FINSBURY) L<sup>TD.</sup>**

**INCORPORATING**

**The FINSBURY OFFICE  
FURNISHING Coy.**

**&**

**J. W. COOKE  
& Coy.**

**FINSBURY PAVEMENT HOUSE, LONDON, E.C.2.**

**Telephones: LONDON WALL { 6179.  
573.**

**See Telephone Book relating to our Shopfitting, Signs and other Departments.**

**KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.**



# EMAILLITE

NON-POISONOUS

AEROPLANE DOPE.

THE ORIGINAL AND STILL THE PREMIER.

AS  
TIGHT



Trade Mark.

AS  
A DRUM.

THE BRITISH EMAILLITE CO., LTD.,  
*Contractors to the Air Board.*

Registered Offices:

30, Regent Street, Piccadilly, S.W.1.

Wire—"Ridleyppren, Piccy, London."

'Phone—280 Gerrard

Works

5, Hythe Road, Cumberland Park,  
Willesden Junction, N.W.10.

Telephone—Willesden 2346 & 2347.

ACCURACY



## J. H. ROBERTSON & CO

### AERONAUTICAL ENGINEERS

Tel. REGENT  
3996

LONDON OFFICE: 1, ALBEMARLE STREET. W.1

*All classes of machining.*

FINE LIMIT WORK.

JIGS, GAUGES, AND SPECIAL TOOLS.

TURNBUCKLES, EYEBOLTS A.G.S. SPECIFICATION.

STAMPINGS, AND HIGH-CLASS STEEL FORGINGS,  
PRESS WORK, &c.

OVERHAULING AND REPAIRS TO ALL TYPES OF  
AERO MOTORS.

PROPELLERS FOR ALL TYPES OF AIRCRAFT.

CRANKSHAFTS, PISTONS, GUDGEON PINS, VALVES A SPECIALITY.





# AIRCRAFT MANUFACTURING COMPANY———LIMITED

**Contractors to**  
**War Office and Admiralty**

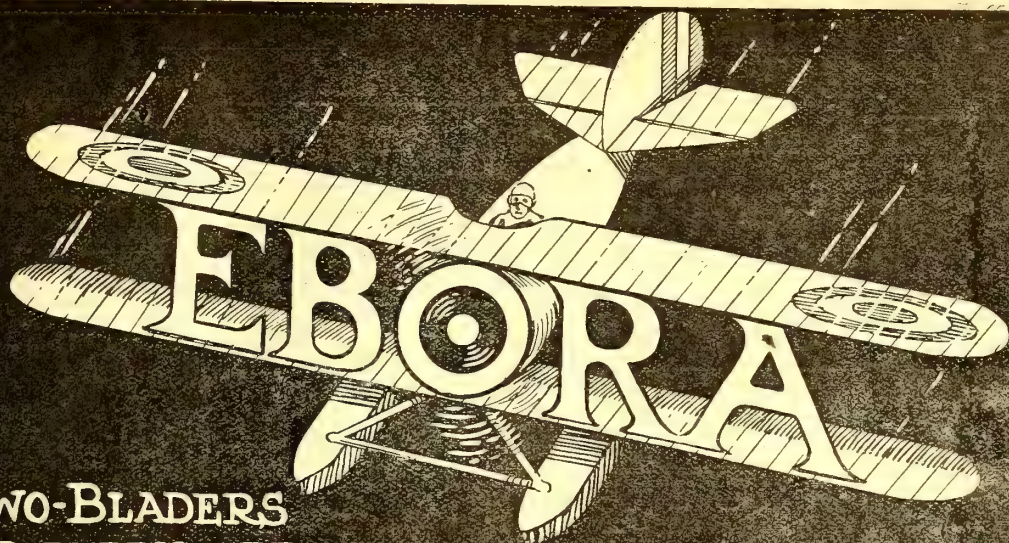
**London Office**

**27, BUCKINGHAM GATE, S.W.1.**

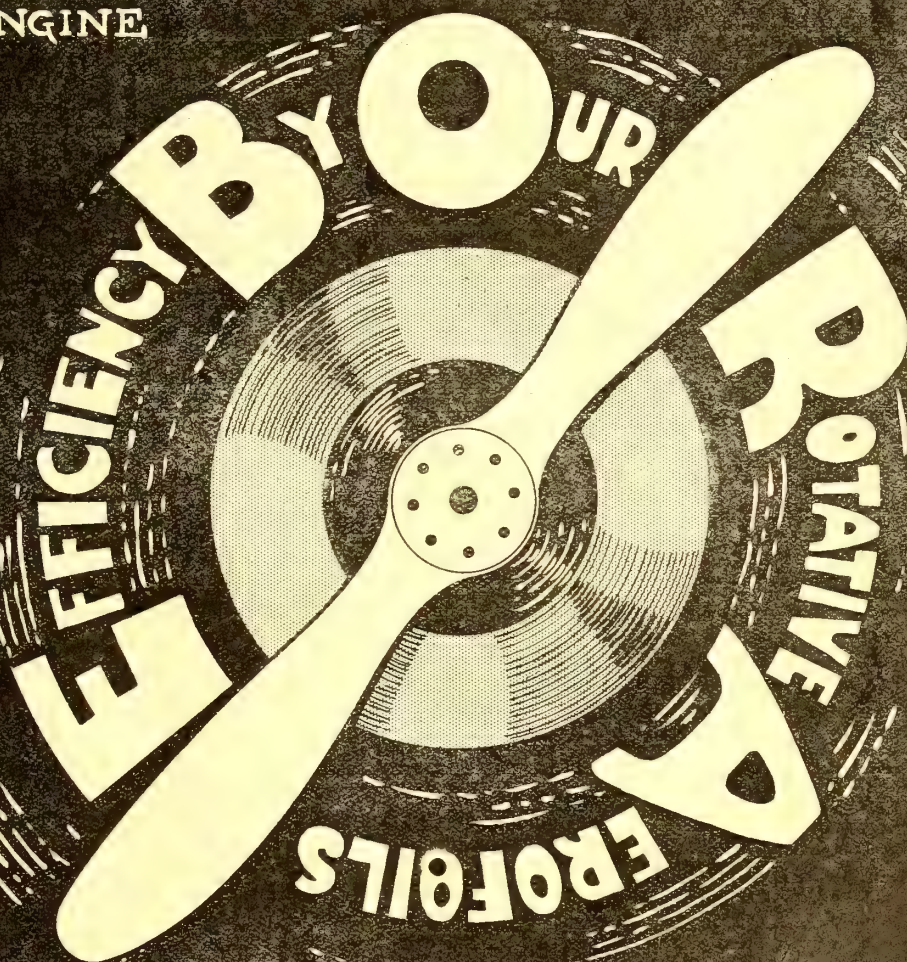
**Offices & Works**

**HENDON, N.W.9.**





TWO-BLADERS  
FOR EVERY TYPE  
OF ENGINE



:: EBORA PROPELLER COMPANY, LIMITED, ::

Directors: Jan Schiere (Du ch), A.F.Ae.S. and Stewart Cole, F.C.A.

11 and 12 SURBITON PARK TERRACE, KINGSTON-ON-THAMES.

Tel phone: Kingston 672.

Telegrams: "Ebora, Kingston."

CONTRACTORS TO H.M. ADMIRALTY AND WAR OFFICE.

DESIGNERS AND MANUFACTURERS OF AIRCRAFT PROPELLERS.



# GNÔME & LE RHONE ENGINE COMPANY

Contractors to the  
War Office and Admiralty

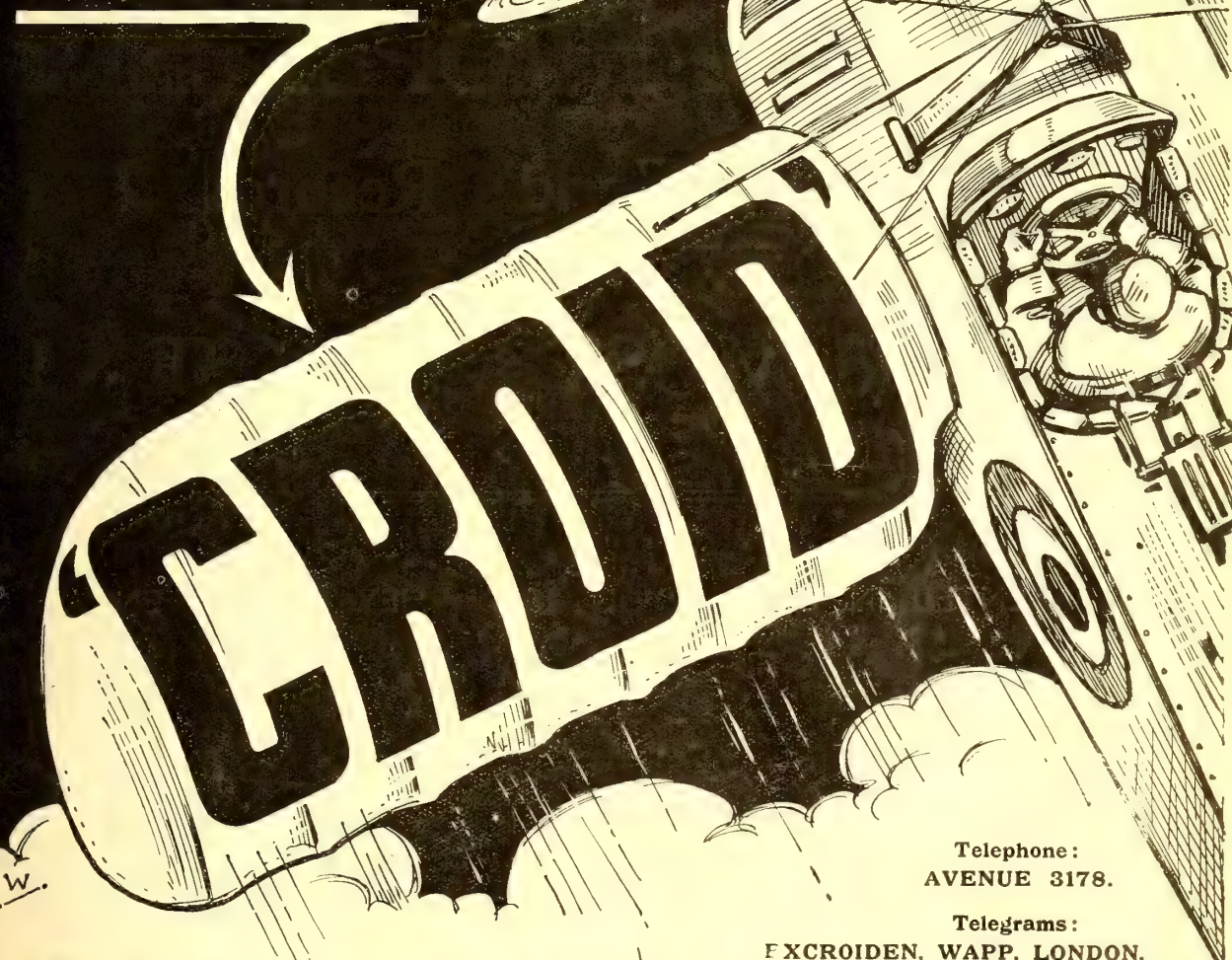
London Offices:

7, VICTORIA STREET, S.W.1., and THE HYDE, HENDON, N.W.9.

Works: Blackhorse Lane, Walthamstow.



**ON A 'PLANE'  
BY ITSELF**



Telephone:  
AVENUE 3178.

Telegrams:  
EXCROIDEN, WAPP, LONDON.

**THE WORLD'S STRONGEST GLUE**

**USED COLD**

"Approved" by H.M. Admiralty and War Office and A.I.D., and employed by the Leading Manufacturers of Aeroplanes, Seaplanes and Propellers.

"STANDARD" STRENGTH FOR RIBS, ETC. (Class 2 work).

"EXTRA" STRENGTH FOR PROPELLERS, SPARS, ETC. (Class 1 work).

Sole Manufacturers:

**THE IMPROVED LIQUID GLUES COMPANY, LIMITED,**  
GREAT HERMITAGE STREET, LONDON, E.1.

**CONTRACTORS TO H.M. GOVERNMENT**



CONTRACTORS TO H.M. ADMIRALTY & AIR BOARD.

# INTEGRAL PROPELLERS

Hold the World's Records

. . . . and are indisputably the . . . .

## BEST and MOST EFFICIENT

PATENTED IN ENGLAND IN 1909 THEY HAVE BEEN  
FIRST AND FOREMOST EVER SINCE.



### THE INTEGRAL PROPELLER COMPANY, LTD.,

is the Firm with the largest output

FACTORIES AT

HENDON, N.W.9.

HIGH WYCOMBE (Bucks).

TOOTING, S.W.

*Registered Offices:—*

THE INTEGRAL PROPELLER COMPANY, Limited,

Edgware Road, The Hyde, ————— Hendon, N.W.9

Telegrams: AVIPROP, HYDE, LONDON.

Telephone: KINGSBURY 104.



# **WOOD PROBLEM** **SOLVED.**

Greatest Invention of the War.

## **HOLLOW SPARS**

**And Struts for all  
Types of Machines**

Any length, shape or sector without joints.

**TESTED AND APPROVED BY THE AIR BOARD.**

10 28700 10

10 • Full Particulars from 10

01 0.87



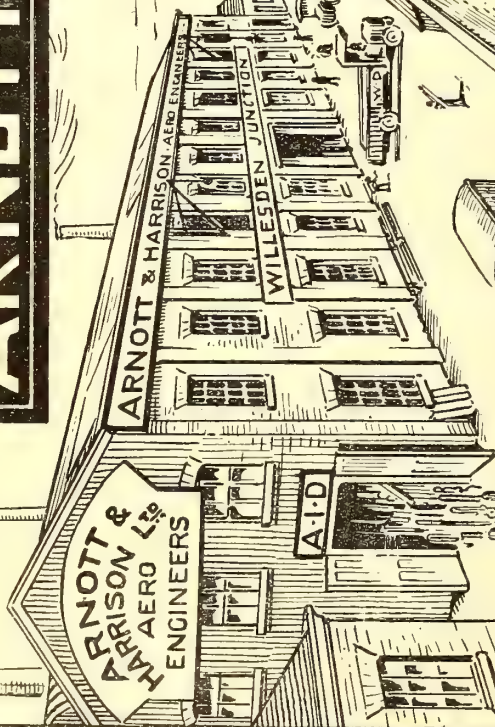
**Robert Young Construction Co., Ltd.**

AEROPLANE MAKERS,

CANONBURY WORKS, CANONBURY STREET,  
ESSEX ROAD, LONDON, N.1.



# ARNOTT-&-HARRISON LTD



Telephone :

WILLESDEN 22-7 (2 lines).

Telegram :

ARNOTHARRI, LONDON.

SPECIALISTS IN ALL  
**DE HAVILLAND**  
**METAL FITTINGS**  
 UNSURPASSED  
 FOR  
**PROMPT DELIVERY.**

HYTHE RD., WILLESDEN JUNCTION, N.W.10

"A & H" SMALL PARTS TO THE RESCUE.



# PROPELLERS ONLY



CONTRACTORS TO  
H.M. GOVERNMENT

Office and Works :  
Propeller Works,  
Balm Road,  
Hunslet,  
Leeds.

Telephone—  
Central 291.  
Telegrams—  
Airscrews, Leeds.





# AVRO

NOTHING BETTER

---

## AVROE & CO. LTD.

TELEGRAMS TRIPLANE      MANCHESTER      TELEPHONE CITY

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# The AEROPLANE

The Editorial and Advertising Offices of "The Aeroplane" are at 166, Piccadilly, London W.I.  
 Telegraphic Address: "Aileron, London." Telephone: Mayfair, 6407.  
 Accounts, and all correspondence relating thereto, should be sent to the Registered Offices of  
 The Aeroplane and General Publishing Co., Ltd., Rolls House, Breams Buildings, E.C.4.  
 Subscription Rates, post free: Home, 3 months, 8s. 10d.; 6 months, 7s. 7d.; 12 months, 15s. 2d.  
 Foreign, 3 months, 9s. 0d.; 6 months, 10s. 0d.; 12 months, 20s. 0d. Canada, 1 Year, \$4.70c.  
 U.S.A., 1 Year, \$5.20c.

## THE REVIEW OF THE YEAR.

To say that 1917 has been the most wonderful year in the history of aeronautics would be merely a platitude, for every year since flying began has been more wonderful than its predecessor. Which is only natural, considering that flying is still in its infancy and is just like a growing child which does something more wonderful every day.

Nevertheless, 1917 really has shown rather more progress in proportion to the preceding year than has previously been the case, for 1917 has seen the dawn of intelligence in relation to aeronautics among highly placed official people and the mere "public" in this country, and it has also seen the awakening—thanks to our friends the enemy—of a multitude of people to the fact that big aeroplanes are definitely important weapons of war. These two developments augur well for the future of aviation, not only during the war but afterwards.

If anything, there is now, at the end of the year, something of a tendency to over-rate the importance of aircraft in war, so far as the public and the newspapers are concerned. Therefore it seems well to point out once more that nothing revolutionises war, and that military science to-day is unchanged by the advent of aircraft. Tactics have been seriously affected, new strategic schemes have been produced, but the basis of the science remains unchanged.

The bombing of towns by aeroplanes affects the course of war less than did the introduction of long-range artillery. The results of air scouting, far from revolutionising war, bring us back nearer to the days when wars were won by sheer man-power, before the development of military science gave the general with the keenest strategic brain the advantage over superior numbers.

### THE COMMAND OF THE AIR.

This very fact increases the importance of the aerial arm, for without aircraft, or with an inferior air force, an army is at the mercy of the brilliant strategist, whereas the command of the air nullifies the work of the most brilliant opponent, even though it cannot in itself bring victory. The very existence of such a possibility as the command of the air has been denied by those in positions which at least lend weight to their utterances, whether true in theory and fact or not.

For example, on April 12th, Lieut.-General Sir David Henderson, then Director-General of Military Aeronautics, speaking at Birmingham, referred to "what people were foolish enough to call command of the air, which had never existed—neither command nor mastery." Major J. L. Baird, Parliamentary Secretary to the Air Board, also spoke in the House of Commons on April 26th of the mastery of the air as a thing which never had existed and never could exist.

Therefore it is most important to note a particularly striking passage which occurred in the despatch, dated

December 23rd, from Sir Douglas Haig, commanding the British Expeditionary Force. Though this appeared in the "London Gazette" of December 29th, 1916, the passage gives the key to all our aeronautical activities during 1917. In it Sir Douglas Haig said:—

"I desire to point out that the maintenance of the mastery in the air, which is essential, entails a constant and liberal supply of the most up-to-date machines, without which even the most skilful pilots cannot succeed."

Later in the same despatch Sir Douglas Haig referred to the duties of the R.F.C., including "the regulation and control of artillery fire, the taking of photographs of enemy trenches, strong points, battery positions, and of the effect of bombardments and the observation of the movements of the enemy behind his lines." Further he said: "In combination between artillery and infantry the R.F.C. played a highly important part." The reference in this case is to what are now commonly known as contact patrols, in which the R.F.C. watches the advance of the infantry and controls the artillery barrage protecting the infantry advance." In yet another passage he says: "Fighting in the air has now become a normal procedure in order to maintain the mastery over the enemy air service."

### NEW DEVELOPMENTS.

These passages should be particularly remembered as summarising the whole duty of aviators operating with the Army, with two notable exceptions. Firstly, the use of bombing machines for the systematic destruction of enemy transport by road and rail and of enemy aerodromes, and, secondly, the institution of regular attacks by low flying aircraft on enemy troops in trenches and in the open. These two activities which were not mentioned by Sir Douglas Haig have since become highly specialised branches of aerial operations, and may be set down as the distinguishing features of aircraft work in 1917, though it must be understood that the operations specifically mentioned by Sir Douglas Haig have been greatly developed during the year.

The first important occurrence of 1917, bearing directly on the Flying Services, was the institution on Jan. 2nd of a new Air Board to succeed Lord Derby's Air Committee. The President of the Air Board was Lord Cowdray, better known as Sir Weetman Pearson, the famous engineer and contractor. Commodore Godfrey Paine, C.B., M.V.O., R.N., was appointed Director of Air Services by the Admiralty, and was made Fifth Sea Lord of the Admiralty as well as a member of the Air Board. This officer thus became O.C. R.N.A.S. Lieut.-General Sir David Henderson, K.C.B., the Director-General of Military Aeronautics and a member of the Army Council, represented the R.F.C. on the Air Board.



Mr. William Weir, of J. and G. Weir's of Glasgow, the famous firm of pump makers, who later became Sir William Weir, was appointed Director of Aeronautical Supplies, and Mr. Percy Martin, of the Daimler Company of Coventry, who was appointed Director of Aero-Engine Supplies, represented the Ministry of Munitions on the Air Board. The Parliamentary Secretary to the Air Board was Major J. L. Baird, M.P. The Board promptly took over the Hotel Cecil for its offices, and after a difficult period spent in putting things in running order proceeded to achieve quite astonishing results

from the middle of the year onwards, as a study of these historical notes will show.

These two matters—namely, Sir Douglas Haig's despatch and the coming into being of the new Air Board—may be considered the governing factors in British aeronautics in 1917.

We may now turn to the actual history of events during the year. These have been divided, as has been customary in previous reviews of the year, into monthly sections, which again are sub-divided into sub-sections of Naval, Military, Home, and Foreign interest:—

### JANUARY.

**Naval.**—The first event of importance to the R.N.A.S. was the unfortunate capture of a brand-new Handley Page biplane by the Germans on Jan. 2nd. This machine, carrying two officers and four men, lost its direction owing to flying into a thunderstorm, which upset its compasses, with the result that it landed in "Hunland" near Laon. The importance of the incident is due to the fact that in consequence of the capture of this machine various modifications were made in the German Gotha bombing machines, which later were the object of considerable interest in this country.

On Jan. 11th H.M.S. "Ben My Chree," one of the earliest of British seaplane-carrying ships, which had done excellent work in the Eastern Mediterranean, was sunk in the harbour of Kastelorizo, an island off the coast of Asia Minor, east of Rhodes. The curious point about this incident was that the ship was sunk by gunfire from the mainland, which was occupied by the Turks.

On Jan. 24th the R.N.A.S. got some of its own back by carrying out a successful bomb raid from Eastern France on the German factories at Burbach, 16 machines taking part in the raid.

Good work by the R.N.A.S. in East Africa was specifically mentioned in General Smuts' despatch published on Jan. 17th, and though this work took place during 1916 it deserves to be mentioned here as it was only made publicly known in 1917.

These were the outstanding events in R.N.A.S. history during the month, but it must be remembered that a vast amount of unchronicled work was done by the R.N.A.S. fighting and bombing squadrons at Dunkirk, in the Balkans, in Mesopotamia, and in the Eastern Mediterranean, as well as the usual large amount of seaplane and airship patrol work in search of enemy submarines. It may be taken that similar remarks apply to all succeeding months, only in a more marked degree, in that under the guidance of Commodore Paine and the Supply Department of the Air Board the R.N.A.S. has grown enormously in size and has increased very greatly in efficiency with remarkable regularity month by month.

**Military.**—Little of interest was chronicled about the R.F.C. during January, though, of course, their work in all war areas continued as usual. General Smuts' despatch of Jan. 17th, already

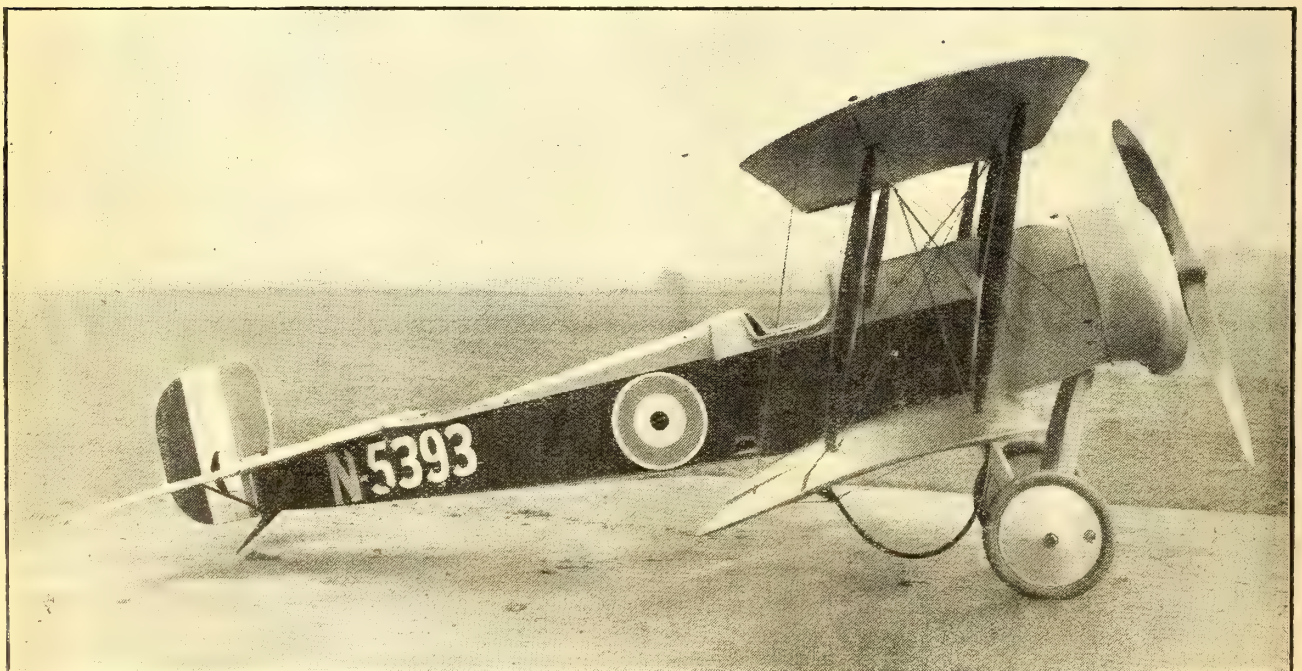
mentioned, also mentioned the excellent work of the R.F.C. in East Africa.

On Jan. 23rd Lord French in a despatch dealing with the Anti-Aircraft Section of the Home Defence Forces, mentioned the work done by anti-aircraft guns and aeroplanes alike, and said that "defensive measures have been successful."

**Home Affairs.**—An event of very considerable interest occurred on Jan. 3rd. It was then announced that the Aeronautical Society of Great Britain, the oldest scientific society in the world concerned with aeronautics—and incidentally a society which must be carefully distinguished from a concern calling itself the Aeronautical Institute—entered into an agreement with the Society of British Aircraft Constructors, which embraces every firm of importance in the Aircraft Industry, to provide for the co-operation and support of the two bodies in their respective spheres, to develop and co-ordinate aeronautical research, and generally to link up the scientific and industrial aspects of aeronautics. A Joint Standing Committee of the two bodies was formed. Special Technical Committees were also formed, and the two societies became thenceforward very valuable helps to the Air Board and to the Government generally in all matters affecting the output of aircraft.

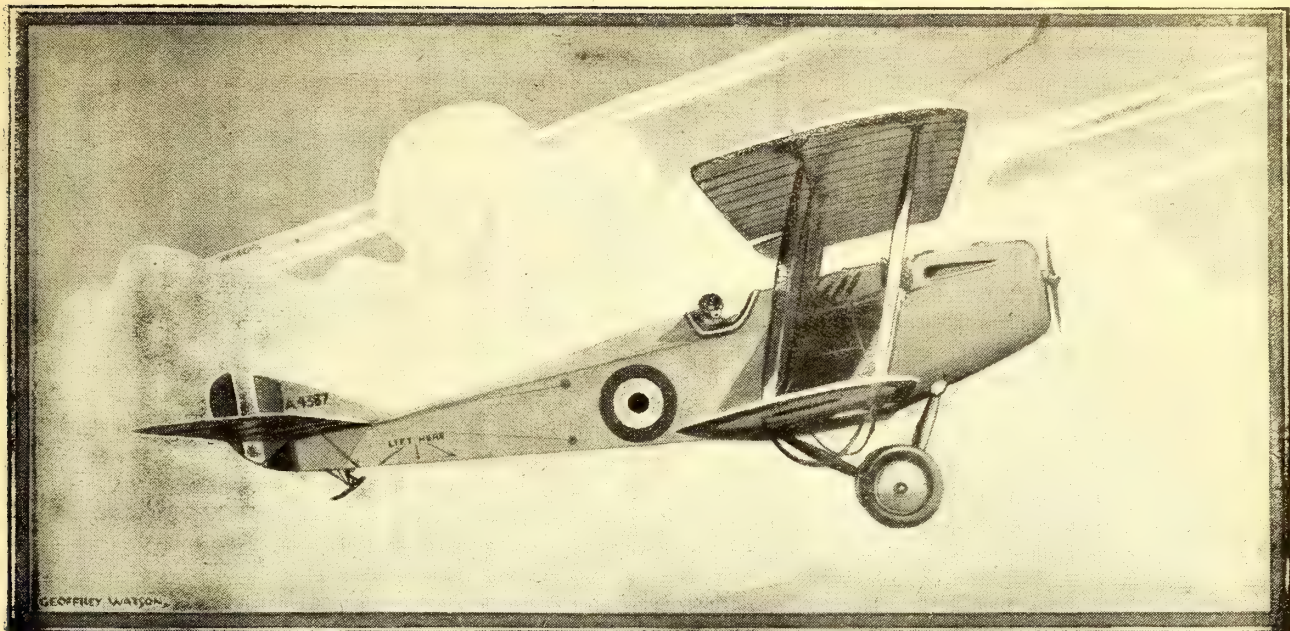
The Aeronautical Society thereupon entered into practically a new lease of life, and has since been probably the strongest institution of its kind in the world. The first meeting of the rejuvenated Aeronautical Society was held on Jan. 24th, when Brig.-Gen. Branker, Director of Air Organisation, R.F.C., delivered a most able lecture on the training of military aviators to the largest audience that had ever been assembled to hear a discourse on aeronautics.

Another matter of considerable importance to the history of aeronautics was the organisation by the Countess of Drogheda of an exhibition of aeronautical pictures and of historical relics concerned with aeronautics. This exhibition was opened at the Grosvenor Galleries, Bond Street, and was visited by all the most important people in official circles. The King and Queen visited the exhibition shortly after it was opened. After being on view in London for some weeks the exhibition was moved bodily in turn to all the leading cities in Great Britain, and finished its British career at the People's Palace, Mile End, in December.

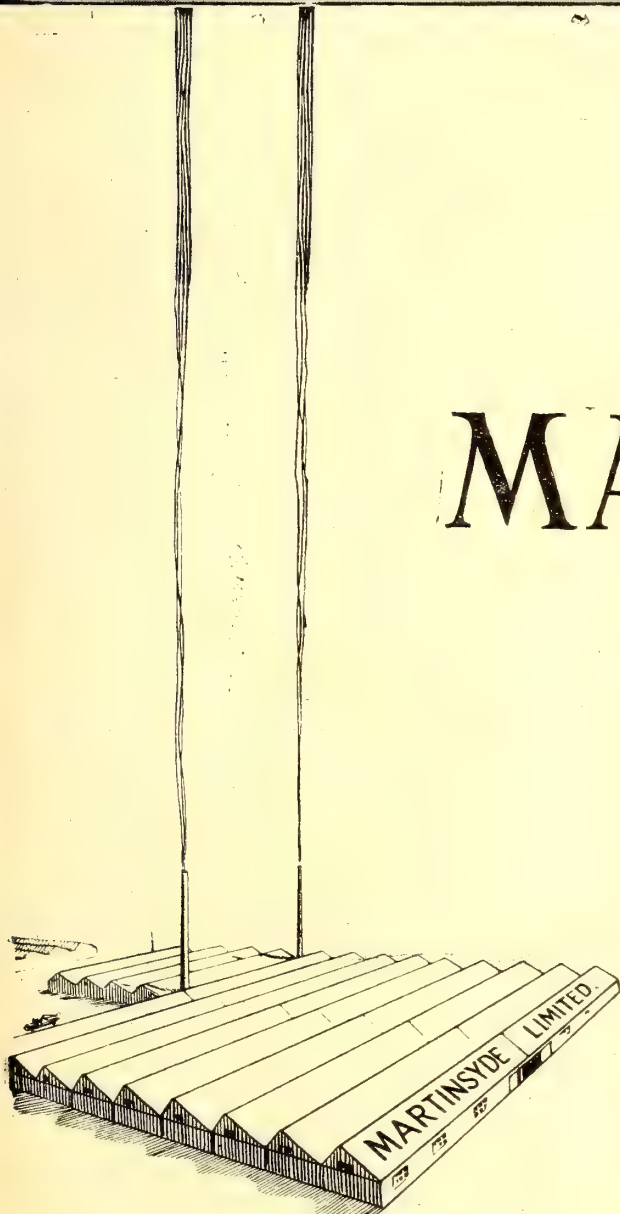


THE BRISTOL BULLET.—A Single-seater Fighter which has performed well during the war.





# MARTINSYDE



Aerodrome . and  
 Auxiliary Works:  
 BROOKLANDS.  
 Head Office  
 & Works :  
 WOKING , Surrey.







# 1917-1918

Looking back on the year that has passed—a year of speeding up in the Aircraft Industry—we have endeavoured under war conditions to give our clients efficient, reliable and comprehensive service—covering most requirements.

1917 found us well equipped for our undertaking. It saw for us the establishment of a permanent home for Aircraft Supplies—in Long Acre—where parts may be inspected and taken away from stock.

1918 sees us even better organised and equipped with, if possible, a greater determination to make “Ascol” Service indispensable.

Our Best Wishes go out to All for 1918.

## The Aircraft

HEAD OFFICES, SHOW-

**ASCOL HOUSE, 125, LONG**

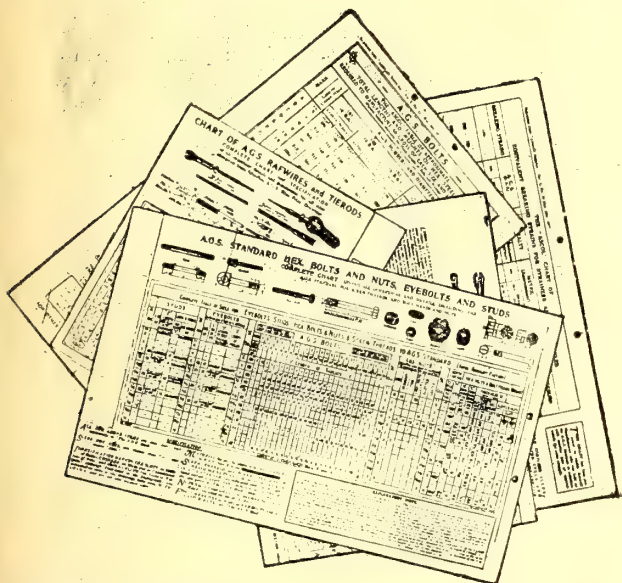
REPRESENTATIVES IN BIRMINGHAM, MANCHESTER,

Managing Director—G. H. MANSFIELD.

Works :—Little James Street.







Volume 3, No. 1 of

### "AIRCRAFT SUPPLIES,"

our fortnightly House Journal, is the first of a new volume and is ready to-day. It contains a Complete List of Aircraft Parts in Stock at the time of going to press, Current Prices, Details of New Items, Enquiry Bureau and a special article by G. H. Mansfield, illustrated with charts and tables and innumerable particulars of interest to Aircraft Manufacturers. Copies of "Aircraft Supplies" will be sent free to the Aircraft Industry. Application should be made on business paper and should state nature of contracts in hand. "Aircraft Supplies" will be appreciated and found of the greatest utility to Aircraft Manufacturers.

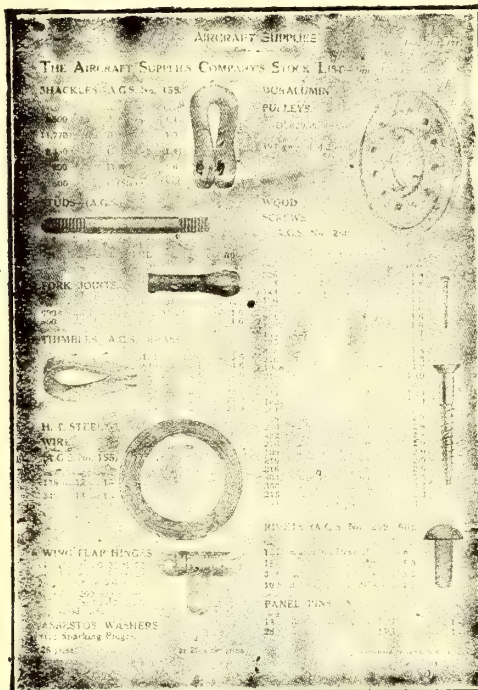
### The "ASCOL" Calendar

for 1918 will be ready shortly and a limited number of copies are available for Aircraft Manufacturers. Applications should be made at once.

Sole Agents for AVRO Patent Turnbuckles.

## "Ascol" Reference Charts!!

We have several very useful charts of A.G.S. & other Aircraft Parts which Aeroplane Manufacturers will find invaluable for reference purposes. Copies mounted on card-board will be sent free on request.



A Stock List Page from "Aircraft Supplies."

# Supplies Co., Ltd.,

ROOMS AND STORES,

ACRE, LONDON, W.C.2.

LEEDS, BELFAST AND THE LONDON DISTRICT.

Telephone :—Gerrard 276.

Telegrams :—"Upcast, Rand," London.











# 1917-1918

Looking back on the year that has passed—a year of speeding up in the Aircraft Industry—we have endeavoured under war conditions to give our clients efficient, reliable and comprehensive service—covering most requirements.

1917 found us well equipped for our undertaking. It saw for us the establishment of a permanent home for Aircraft Supplies—in Long Acre—where parts may be inspected and taken away from stock.

1918 sees us even better organised and equipped with, if possible, a greater determination to make "Ascol" Service indispensable.

Our Best Wishes go out to All for 1918.

## The Aircraft

HEAD OFFICES, SHOW-

ASCOL HOUSE, 125, LONG,

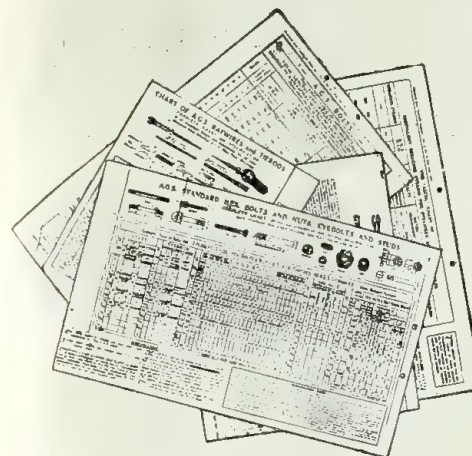
REPRESENTATIVES IN BIRMINGHAM, MANCHESTER.

Managing Director—G. H. MANSFIELD.

Works:—Little James Street.



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



Volume 3, No. 1 of

### "AIRCRAFT SUPPLIES,"

our fortnightly House Journal is the first of a new volume and is ready to-day. It contains a Complete List of Aircraft Parts in Stock at the time of going to press, Current Prices, Details of New Items, Enquiry Bureau and a special article by G. H. Mansfield, illustrated with charts and tables and innumerable particulars of interest to Aircraft Manufacturers. Copies of "Aircraft Supplies" will be sent free to the Aircraft Industry. Application should be made on business paper and should state nature of contracts in hand. "Aircraft Supplies" will be appreciated and found of the greatest utility to Aircraft Manufacturers.

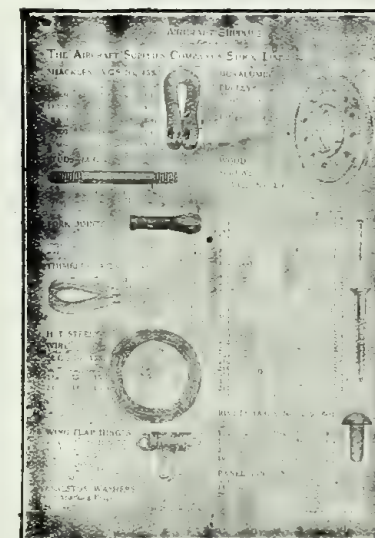
### The "ASCOL" Calendar

for 1918 will be ready shortly and a limited number of copies are available for Aircraft Manufacturers. Applications should be made at once.

Sole Agents for AVRO Patent Turnbuckles.

### "Ascol" Reference Charts!!

We have several very useful charts of A.G.S. & other Aircraft Parts which Aeroplane Manufacturers will find invaluable for reference purposes. Copies mounted on card-board will be sent free on request.



A Stock List Page from "Aircraft Supplies."

## Supplies Co., Ltd.,

ROOMS AND STORES,

ACRE, LONDON, W.C.2.

LEEDS, BELFAST AND THE LONDON DISTRICT.

Telephone:—Gerrard 276.

Telegrams:—"Upcast, Rand," London.



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



During its tour of the country it was visited by many hundreds of thousands of people of all classes, from the highest to the lowest, and did great work in educating the public both as to the history and importance of aircraft.

## FEBRUARY.

**Naval and Military.**—Presumably owing to the weather, there is very little to chronicle concerning air war during the month of February. No notable event is recorded in connection with the R.N.A.S., and as regards the R.F.C. the only event of note was the award of a posthumous Victoria Cross to Serjt. T. Mottershead, R.F.C. His machine was set on fire in an air fight and despite the flames he succeeded in landing, and thus saved the life of his passenger, he himself dying of burns later on. This was the R.F.C.'s first V.C. of the year.

An amusing story went the rounds of the Press towards the end of the month relating how two British pilots, flying together, shot a German aviator who landed safely and died immediately after landing. The British pilots alighted alongside the German machine, ejected the dead pilot, one of them climbed into the machine while the other started the engine, after which the second pilot returned to their own machine, and the two flew side by side back to the British lines, thus capturing a modern German machine perfectly intact. No official confirmation of the story has been received.

**Home Affairs.**—The only event of importance in February was the announcement of the knighting of Sir William Weir on February 11th.

**Foreign Affairs.**—An item of interest was noted on February 24th when a French airship bombed the mines in German hands at Briey, thus showing that the airship could still be a weapon of war of importance.

## MARCH.

**Naval.**—Again there is little to chronicle specifically concerning the R.N.A.S., but it is noteworthy that in a despatch from Sir Douglas Haig on March 17th the Field Marshal expressed particular appreciation of the work of No. 8 Squadron, R.N.A.S., which had destroyed 14 enemy machines and driven down 13 while co-operating with the Army.

**Military.**—The beginning of March was remarkable for the renewed activities of German aeroplanes, which were put into the air in vast quantities of improved quality to prevent the R.F.C. from keeping track of the further retirement of the German Army from the positions to which it had been beaten back in the battles of the Somme during the previous autumn. This retirement, it will be remembered, left a large space of ground over which the British Army had to move their heavy guns, and at the limits of which they had to establish new railheads before they could attack the new German positions, with the result that the spring offensive, which should have started early in the year, was considerably delayed, and when it was made had to be made against the strongly prepared defences since known as the Hindenburg Line.

This move was one of the greatest strategic operations of the war, and the intense activities of the German aviators at this period emphasised once more the importance of the mastery in the air to which Sir Douglas Haig had referred.

A hint was given of the immense growth of the R.F.C. under the new régime when Mr. Forster announced in the House of

Commons the formation of new flying schools for the R.F.C. in Canada and in Egypt. The matters of the greatest importance to the R.F.C. occurred in reality in connection with incidents more properly relating to home affairs.

**Home Affairs.**—On March 7th Sir Henry Dalziel asked in the Commons whether "we still maintain the mastery of the air in the Western Front." Mr. Macpherson, the Under-Secretary of State for War, who is remarkable among politicians for his preference for giving honest and truthful answers where possible, replied: "I think I can give that assurance," a reply which drew exclamations of "Oh!" from the House.

Sir Henry Dalziel repeated exactly the same question on March 13th, when Mr. Macpherson, having informed himself on the subject in the meantime, replied: "The situation is similar to that which existed at the same period of last year, when at that time the Germans, reinforced and rested during the winter, put up a serious opposition."

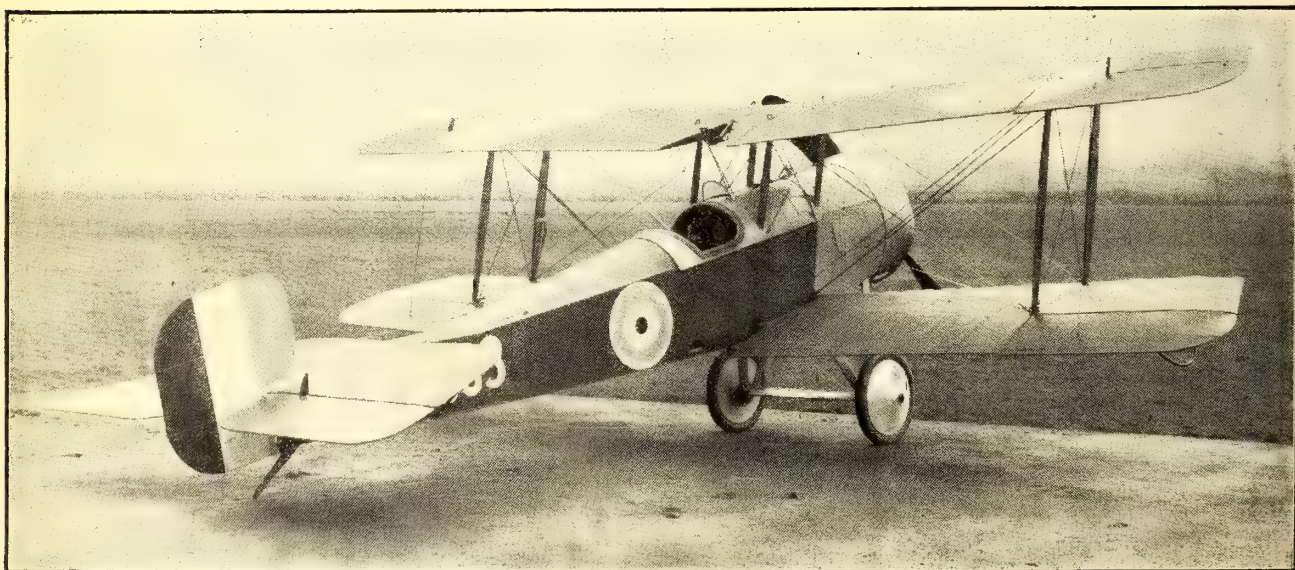
It may be well to recall that the period to which Mr. Macpherson referred was that which was covered by what was commonly known as the Fokker Scourge, when agitation in the House led to the appointment of the notorious Air Inquiry Committee of 1916. Thus it may be seen that Mr. Macpherson's honest admission of the truth implied a very serious condition of things at the Front.

On March 7th Mr. Joynson-Hicks, M.P., was elected chairman of the Parliamentary Air Committee, a non-political, non-party body of members of both Houses of Parliament, which soon became the largest one-purpose combination of its kind in the political world. Under his chairmanship this Committee has been a very considerable influence on the history of British aeronautics.

It is worth while to recall that all this politico-service agitation of March, 1917, had to do with the activities of the new small single-seater German machine of the Albatros type, the advent of which was discussed in THE AEROPLANE on Nov. 22nd, 1916. Thus we see exactly a repetition of the events of a year earlier, when the agitation at home about the Fokker Scourge during the first three months of 1916 had to do with the new German machines, concerning which a warning had appeared in THE AEROPLANE towards the end of 1915. The writer apologises for importing this personal note into an historical record, but would explain that it is a matter of history, and indicates not only history's habit of repeating itself, but the knowledge and foresight of those who brought the facts to his attention at those times.

As a matter very directly affecting later history it is to be noted that on March 16th General Brancker, addressing a distinguished gathering at Lady Drogheda's Aeronautical History Exhibition, expressed the belief that defence against airships was a task which could be handled with sufficient certainty, but that defence against aeroplanes was a much more difficult matter. He said that our best defence in the future would be to build up such strength in the air that no other nation would dare to attack us for fear of the consequences. "In this direction," he said, "lies the way for the creation of a great Imperial Air Service."

These views of General Brancker's have been continually confirmed since they were then expressed, and they may be taken as the text for all sermons on the future aeronautical history of this country.



A three-quarter rear view of the Bristol biplane.



**Foreign Affairs.**—On March 5th a bomb raid was made on Salonika by a squadron of twin-engined German machines. This was the first appearance against British forces of the Gotha bomb-droppers which afterwards became so prominent. It is understood that two of these machines were brought down on that day by an R.F.C. officer, who continued afterwards to do most distinguished work in the Balkans. This particular squadron had previously operated against the undefended city of Bukarest, but until this date its composition and the type of machines used was not understood. After thus "trying it on the dog" in the Balkans the squadron was moved bodily to Flanders and became the nucleus of the fleets which have since made a habit of invading England.

On March 8th Cavalry-General Ferdinand Count von Zeppelin, the inventor, designer, and constructor of the famous Zeppelin airships, died. Though one of this country's greatest enemies, it is necessary to record that he was also one of the greatest and bravest pioneers of aeronautics, and that he was always an enemy worthy of respect.

On March 17th a Zeppelin which had attempted to bomb Paris was brought down at Compiègne. This was one of the very few attempts made by enemy airships to attack the French capital.

On March 21st Prince Friedrich Karl of Prussia, the only royal aviator in any of the belligerent countries, was shot down while flying over the English lines and in attempting to escape was wounded by Australian troops. He died of his wounds a few days later.

On March 28th the famous M. Armand Deperdussin was brought to trial in Paris on charges for which he had been imprisoned since some six months before the war. The trial, which was conducted with all the circumstance of a thrilling stage drama, concerned the embezzlement of certain money borrowed from a French bank on bogus business documents and devoted by M. Deperdussin to the building up of a great aircraft business. On account of the high service done to the development of French aeronautics by this business M. Deperdussin was acquitted—a verdict which indicates clearly both the common sense of the French nation and the difference between law and justice.

#### APRIL.

**Naval.**—The first matter of note in connection with the R.N.A.S. was that on April 2nd, when challenged by Mr. Pemberton-Billing to mention the name of any R.N.A.S. officer who has ever produced an aeroplane of use on active service, Dr. Macnamara, on behalf of the Admiralty, could only give the name of Wing Comdr. Porte, R.N. The name of Comdr. Porte has since become famous in connection with the Porte boats designed by him, first of all in America in conjunction with Mr. Curtiss, and later improved in this country. The reply indicated that the Porte boats were already doing good work against submarines, though not so stated at the time.

On April 14th the R.N.A.S., in conjunction with French aeroplanes, 23 machines in all, carried out a big raid on the German town of Freiburg with very considerable result. On this occasion a wing commander, who was also a lieutenant-colonel of Marines, was shot down and captured. The officer in question is the most senior officer of either of the Flying Services who has so far become a casualty on active service. This raid was largely advertised as being a reprisal for the sinking of the hospital ship the "Gloucester." For some curious reason this was almost the last, if not the very last, British raid into Germany. Since then a few raids have been made into Alsace-

Lorraine, but only one into Germany proper up to the end of the year.

**Military.**—On April 7th, Easter Saturday, the R.F.C. in France fought one of their greatest actions in the war during the opening of the Battle of Arras. It was officially admitted that 28 British machines were missing on that day. The Germans claimed 44 victims in all, including French machines, and their official communiqués stated that some entire squadrons were destroyed. Our own official communiqués showed later that, between April 3rd and April 9th inclusive, 49 of our machines were missing in the week. It became known later that among these were several of at least two brand-new types of British machines which were only put into service for the first time during that week.

On April 10th it was announced that Brig-Gen. Brancker had been appointed Deputy-Director-General of Military Aeronautics, and that Col. Charlton had been promoted to Brigadier-General and made Director of Air Organisation, two changes which were followed by notably good results.

On April 16th the "London Gazette" announced that his Majesty the King has been pleased to become Colonel-in-Chief of the R.F.C.

**Home Affairs.**—The agitation which began in March grew to considerable intensity in April. On April 3rd Mr. Macpherson, in reply to Mr. Pemberton-Billing, said that there were then 207 commissioned officers of the R.F.C. under the Air Board, only 29 of whom were pilots, and Dr. Macnamara, replying to the same member, said that there were 209 R.N.A.S. officers under the Air Board, only 38 of whom were pilots. The figures seem to indicate a lack of practical knowledge of aviation among those at headquarters.

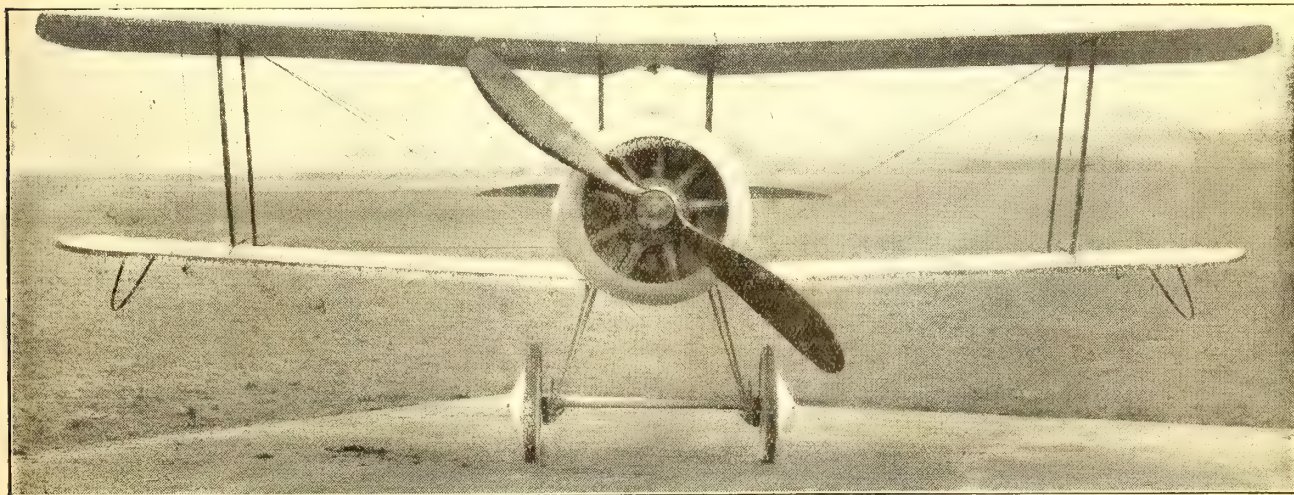
On April 4th Mr. Winston Churchill in a strong indictment of the Air Board blamed the House of Commons "for relaxing its vigilance and for being so easily put off." He said further:—"Never since the Battle of the Marne has the situation been more serious than at present."

On April 8th the aeronautical correspondent of the "Observer," who signs himself "C. W.," wrote: "There is a widespread conviction that the Air Ministry has not even yet succeeded in putting on a proper basis the manufacture and delivery of the fastest and highest climbing aeroplanes, and that the old evil of preference for Government designed machines and engines still exists." Reference was made to unbusinesslike and wasteful contracts, and to aeroplanes and rigid-type airships of proved inferiority being made in large numbers. The same writer continued: "All these questions demand an immediate answer or the present authorities will wake up one morning to find that an impartial investigation is being conducted over their heads."

The question of the clothing of the Flying Services was raised in the House on April 19th, when Mr. Pemberton-Billing drew attention to the anomalies of R.N.A.S. rank badges, and Mr. Boland descanted on the injustice of compelling officers to wear R.F.C. tunics.

On the same day, April 19th, his Majesty the King, accompanied by the Queen, paid a visit to the Sopwith works at Kingston.

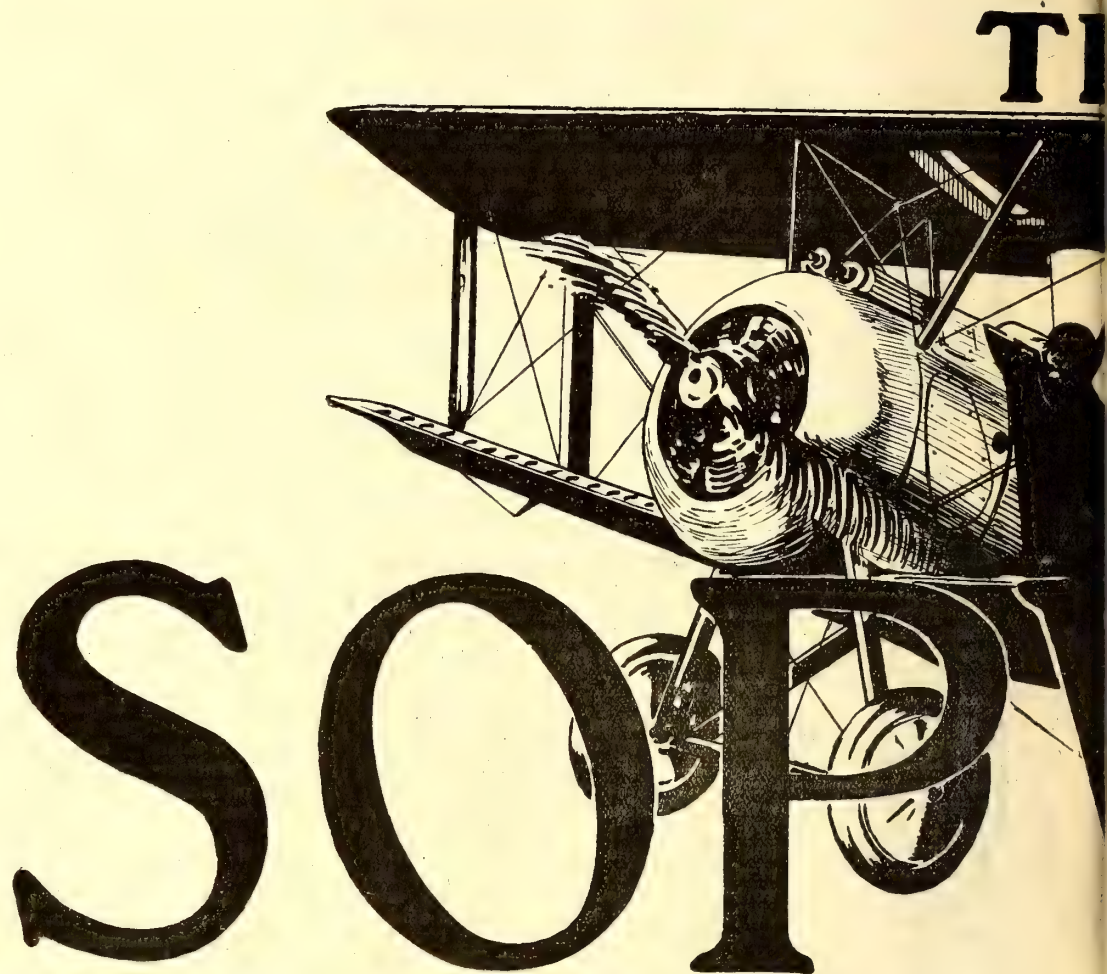
The question of the war profits of aircraft concerns was raised by Major Burgoyne on April 24th, but Mr. Bonar Law, as Chancellor of the Exchequer, refused to recognise the principle that preferential treatment of any kind should be given to the pioneer firms of the Aircraft Industry, who had risked everything they had before the war on the future of aviation. The result



A front view of the Bristol Bullet. The clean outline of the machine and the absence of head-resistance is noteworthy.



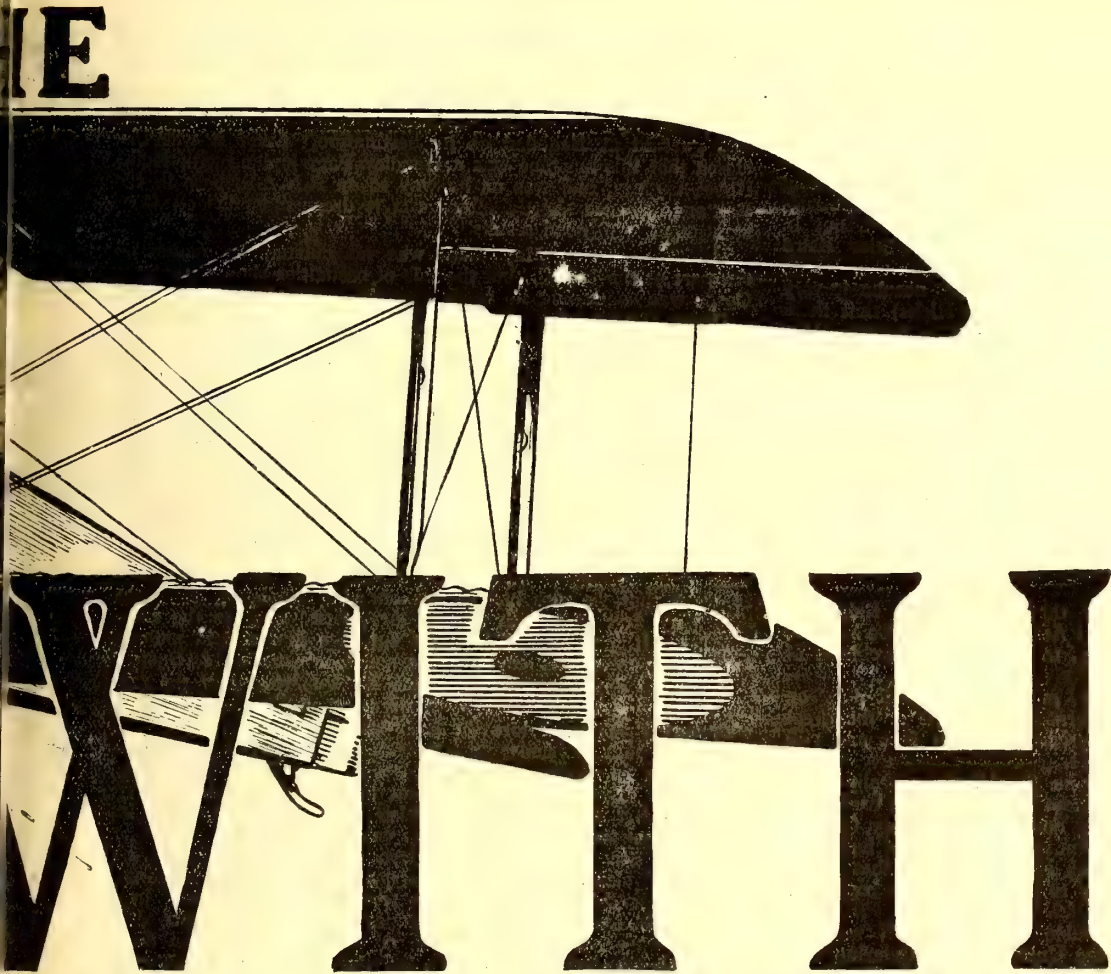
S.C.G.



**AVIATION COM**  
**KINGSTON-ON-TH**  
: : *CONTRACTORS TO*

Telephone : KINGSTON 1988 (8 lines).  
Telegrams: SOPWITH, KINGSTON.





**PANY, LIMITED**

**AMES, ENGLAND.**

**H.M. GOVERNMENT. : :**



Paris Office :  
21, RUE DU MONT THABOR.







S.C.G.

# THE SOPWITH

**AVIATION COMPANY, LIMITED**  
**KINGSTON-ON-THAMES, ENGLAND.**  
: : CONTRACTORS TO H.M. GOVERNMENT. : :

Telephone: KINGSTON 1988 (8 lines).  
 Telegrams: SOPWITH, KINGSTON.



Paris Office:  
 21, RUE DU MONT THABOR.



of this treatment is that firms which would otherwise have come to smash but for the profits they are making out of aircraft built according to the designs of the pioneer firms, are allowed to make all their pre-war profit plus a handsome percentage of increase on it, whereas the pioneer aircraft firms are compelled to be content with only a fraction of such profits owing to the Government taking 80 per cent. of their profits above 10 per cent. on their capitals, which capitals are very small in comparison with their turn-over.

On April 25th Major Baird, on behalf of the Air Board, admitted to Mr. Pemberton-Billing that B.E.2Cs, 2Ds and 2Es were still used by the R.F.C. over the enemy's lines.

On the 26th there was a full-dress debate on the Flying Services in the House of Commons. The debate was opened by an apologetic statement by Major Baird, which showed that many of the earlier criticisms of the administration of the Flying Services had been taken to heart by the Air Board. Concerning B.E. machines he said: "I do not deny that if they (commanding officers) had other machines they would send them out in preference." Concerning the mastery of the air, Major Baird said, referring to a speech made by Mr. Joynson-Hicks, "I do not know who invented the expression, but it has absolutely very little meaning. I can tell him (Mr. Joynson-Hicks) that there is no such thing as the mastery of the air." One assumes that Major Baird did not, while preparing his speech, refer to Sir Douglas Haig's despatch which is quoted at the beginning of this article, otherwise one presumes that he would not have taken it upon himself thus to contradict flatly the Field Marshal Commanding-in-Chief, B.E.F.

In the course of the same debate Mr. Pemberton-Billing suggested that there was "an opening for a sustained air offensive quite independent of the requirements of the Naval and Military Wings." This suggestion was justified many months later by the introduction of the Air Force Bill. Major Burgoyne later in the debate disclosed some interesting facts relating to the R.A.F. and its early history.

In the course of this sitting of the House Major Baird announced the appointment of a Civil Aerial Transport Committee, with Lord Northcliffe as chairman, to consider the problems of the use of aircraft after the war.

The British Aircraft Industry sustained a great loss on April 6th by the death of Mr. Horace Short, one of the great pioneers of aeronautics and the producer of the first and still one of the most successful seaplanes.

**Colonial Affairs.**—An extract from the "Sydney Daily Telegraph," published on April 18th, stated that excellent work was being done at the Richmond Flying School, near Sydney, founded in March, 1916. It was pointed out that 24 students had been passed out by August of that year, and that 19 of these were qualified aviators and on their way to England by the beginning of 1917.

**Foreign Affairs.**—The most notable event of April was the entry of America into the war, the United States declaring war on April 11th. Thereafter this country was continually entertained by wonderful accounts in the American Press of the immediate prospects of tens of thousands of American machines and pilots coming to Europe to stop the war. It may be here stated that such American pilots as have taken part in the war in both the French and British Services have done very fine work, and that every confidence is felt in America's ability ultimately to supply aircraft and aviators of high quality and in great quantity, but it must be put on record here that up till the end of the year 1917 no American aviator on an American aeroplane had taken part in active service operations in Europe.

French reports of the operations of the Army of the Orient recorded much gallant work by R.F.C. personnel co-operating with the French in the Balkans between April 10th and 14th.

A notable achievement by the R.F.C. in the Balkans was the bringing down on April 23rd of a brand-new Halberstadt biplane, with the officer commanding the German Flying Corps in that area on board.

On April 20th it was recorded that the Italian Minister of Posts had sanctioned the institution of a mail service to Sardinia with the idea of avoiding the dangers from submarines. This was the first intimation of the institution by any Power of an officially sanctioned regular mail service by aeroplane.

During April much was heard in German communiqués of the doings of Cavalry-Capt. Baron von Richthofen. On April 12th his 40th victory was recorded and on the 23rd his 46th personal victory, which made the 100th victim claimed by his squadron. On the 30th he scored his 52nd victory, and then disappeared from the German communiqués until July 3rd. It appeared afterwards that he had returned to Germany for two months to instruct those in charge of the training of new aviators in his particular methods of operations.

On April 30th there was considerable sensation in Holland owing to bombs being dropped on the town of Zierikzee. Every belligerent country in turn denied responsibility, but after many months it was discovered and officially stated that these bombs had been dropped by a British aviator under most curious circumstances, which proved that he was quite ignorant at the time of the fact that he had dropped any bombs at all.

## MAY.

**Naval.**—The first score to the credit of the R.N.A.S. in May was a big bombardment of Zeebrugge on May 12th which produced considerable results.

On May 14th the German airship L.22 was destroyed in the North Sea by Naval forces, later disclosed as belonging to the R.N.A.S. An interesting comment on the operations against Zeebrugge appeared in the Paris "Figaro" on May 15th, when it was remarked that "foresight would have dictated unceasing renewal of attacks on Zeebrugge."

On May 30th a British biplane arrived at the Centocelle aerodrome at Rome from London via Paris, Marseilles, Turin, and Pisa, and left on the 31st for the East. The Italian papers of the period referred to the presence on board of sleeping-berths, and guessed at Baghdad as its destination. Later it was disclosed that this machine was a Handley Page biplane with Rolls-Royce engines, and was on its way to an R.N.A.S. base in the Balkans, whence shortly afterwards it dropped bombs on Constantinople with good results.

**Military.**—During May there was no outstanding action on the part of the R.F.C., but the tale of casualties showed that the Corps was continuing its work with its usual energy.

**Home Affairs.**—On May 4th the "Times," commenting on the aerial situation, said: "Whenever we relax our efforts at home a great nation like the German will beat us," and said further: "Our men will prevail in the end if only the home organisation is equal to the energy at the Front."

On May 7th poignancy was given to these remarks by an aeroplane which came over North-East London by moonlight and dropped a few bombs. Small damage was done, but the fact that a German aeroplane could reach London and return was demonstrated and should have been a sufficient warning to the authorities to prepare for what followed at a later date.

On the 10th, owing to the Press discovering that the Germans were using seaplanes which dropped torpedoes, Dr. Macnamara admitted that we also had torpedo-carrying seaplanes, and that they were first used with success in August, 1915, in the Dardanelles. It may be well to point out here that certain patents for torpedo-aeroplanes stand in the name of Commodore Sueter, C.B., R.N., formerly Director of the Air Department of the Admiralty, and that the Government were carrying out experiments with such machines before the outbreak of war.

On May 16th this paper gave warning that the buying arrangements then in vogue at the Air Board were bad; a warning which was justified by the fact that the question was seriously taken up by the Society of British Aircraft Constructors in August, when decided improvements were made.

On the same day Dr. Macnamara stated that we had seaplanes for "slow flying at low altitudes" for submarine chasing. One may remark that hitherto the trouble of the R.N.A.S. had been that almost all the old seaplanes flew slowly at low altitudes whether chasing submarines or not. On the same date Mr. Pemberton-Billing asked whether the Admiralty would consider the institution of a regular system of Naval aircraft patrols on trade routes to convoy incoming food ships. Subsequent history seems to indicate that this fairly obvious suggestion was put into force at a considerably later date.

A humorous comment on the general arrangements for home defence was made on May 17th by the Rev. Mr. Hertslet, who said in the course of a thanksgiving sermon in that town that for two years Ramsgate had been miraculously protected by God, though their protection in other ways had not been very obvious.

On the 22nd Major Baird, in replying to a question by Mr. Pemberton-Billing as to the dislike of officers for the R.E.8 biplanes, said that these machines were much in demand by artillery observation squadrons. Subsequent events seem to indicate that, as in the case of the B.E. series, the R.E.8s were used because there was nothing else available.

On the 23rd Major Baird announced in the House the constitution of the Civil Aerial Transport Committee already announced. The members then announced were: Lord Northcliffe, chairman; Major Baird, deputy-chairman; the Duke of Atholl, chairman of the Royal Aero Club; Lord Montagu; Lord Sydenham; Mr. Balfour I. Lowe, K.C.; Mr. Berriman; Mr. G. B. Cockburn, Chief Inspector of Aeroplanes, A.I.D.; Mr. Holt Thomas, of the Aircraft Manufacturing Co.; Mr. Claude Johnson, of Rolls-Royce, Ltd.; Mr. Joynson Hicks, M.P., chairman of the Parliamentary Air Committee; Mr. Lanchester, of the Daimler Co.; Lieut.-Col. Mervyn O'Gorman; Major-Gen. Ruck, chairman of the Aeronautical Society; Mr. Siddeley, of the Siddeley-Deasy Co., Ltd.; Mr. Sopwith, of the Sopwith Aviation Co., Ltd.; Mr. H. G. Wells, novelist; Mr. H. White Smith, of the British and Colonial Aeroplane Co., Ltd., and chairman of the Society of British Aircraft Constructors; Mr. Tyson Wilson, representing Labour; Sir Laurence Guillemard, representing the Treasury and Board of Customs; Col. Pringle, of the Board of Trade; Lord Drogheda, representing the Foreign Office; Mr. Murray, of the Post Office; Sir Thomas Mackenzie, representing New Zealand; the Right Hon. W. P. Schreiner, representing South Africa; Mr. Grindle, of the Colonial Office; Capt. Vyvyan, R.N., representing the R.N.A.S.; Brig.-Gen. Brancker, repre-



senting the R.F.C.; the secretary being Mr. D. O. Malcolm, and the offices at Winchester House, St. James's Square, S.W.1.

On May 23rd Mr. Pemberton-Billing asked the Leader of the House whether he would give a reason for the reluctance shown by the Government to institute reprisals on Germany for air raids in this country. No reply was given. The point of this question was emphasised on May 24th, when a Zeppelin raid was made on the East Coast, killing one man, and greater emphasis was given to the question, when 16 Gotha biplanes raided the South-East Coast and dropped a number of bombs on Folkestone, killing 76 people and injuring 174.

An event of considerable importance occurred on May 30th, when Mr. Holt Thomas, of the Aircraft Manufacturing Co., delivered a lecture on Commercial Aeronautics to a large and most distinguished audience at the Central Hall, Westminster, some 3,000 people being present. This constituted quite the largest audience ever gathered together to hear a discussion on aeronautics.

Continuing their encouragement of aeronautical affairs their Majesties the King and Queen paid a visit on the 31st to the works of the Aircraft Manufacturing Co., Ltd., and displayed great interest in the various machines and machinery which they inspected.

## JUNE.

**Naval.**—The Admiralty showed its appreciation of the Army by publishing in a special communiqué on the 11th the thanks of Sir Douglas Haig for the good work done by the R.N.A.S. squadrons operating with the Army.

On the 15th was published a despatch from Rear-Admiral Charlton bearing witness to the good work of the R.N.A.S. in East Africa between August and September, 1916.

On June 14th Zeppelin L.43 was destroyed by Naval forces in the North Sea, and it is understood that this action also was to the credit of the R.N.A.S.

There was no outstanding action of the R.N.A.S. that month, but the work of the Service continued with unabated energy.

**Military.**—No special events are recorded during June, but the R.F.C. was paid a noteworthy compliment by Gen. von Höpner, commanding the German Flying Corps on the West Front, who stated in print that French technical preparedness was middling, but the English technical work was inferior. "Nevertheless," said he, "the English show in air fights that they are of Germanic race." Gen. von Höpner also mentioned that the English Sopwith triplanes were excellent machines, and evidently the expression of this opinion carried considerable influence in Germany, for in the autumn Fokker triplanes appeared on the West Front, these machines being strongly influenced by Sopwith design.

On June 29th a communiqué stated that the R.F.C. had been carrying out a series of bombing raids in Palestine, and that one of these raids had been made at a point near Jerusalem on the 26th.

**Home Affairs.**—Operations in the London war area became considerable on June 5th, when 16 or 18 Gothas appeared over the Thames estuary. One came down in the Thames and two were destroyed on the other side of the Channel by the R.N.A.S. Four other raiders were reported as having been brought down, but their destruction was uncertain. The result of the raid was 12 killed and 36 injured.

These operations were continued, and on June 13th London received something of a shock when 15 Gothas appeared over eastern London, killing 97 and injuring 439 people. It was stated later in Germany that this raid was led by Capt. Brandenburg.

On the 13th Lieut.-Col. Mervyn O'Gorman delivered before the Aeronautical Society the annual Wilbur Wright Memorial lecture, his subject being "The Future of Aeronautics." The occasion was made still more notable because the chair was taken by Major Dodd, U.S. Army, and Chief Aviation Staff Officer to Gen. Pershing, Commanding U.S. Forces in Europe.

On the 14th, *apropos* air raids, Sir George Cave, the Home Secretary, admitted that "it would be worth the enemy's while to have these raids every day," because "if you give warning to all munition factories, you put a stop to the manufacture of

munitions, which will have its effect on the fighting forces and the lives of our soldiers and sailors." Further he said: "Warning only results in the loss of a day for many thousands, perhaps hundreds of thousands of workmen." Mr. Bonar Law was apparently of the opinion that reprisals were unnecessary because "our Air Forces in France have raided the German communications and all the military objectives behind the enemy lines."

On June 17th a Zeppelin raid was made on the South and South-East Coast, but only killed two and injured 16 in Kent. Airship L.48 was brought down in East Anglia by Capt. Sandby and Lt. Holder, R.F.C. The incident is notable on account of the escape of three of the crew of the Zeppelin who somehow avoided being killed in the smash. The commanding officer of this ship was Capt. Schütze, one of the most distinguished of German airship officers, and with him was Capt.-Lt. Eichler, formerly captain of one of the Hamburg-America liners and also one of Germany's best airship officers.

On the same day a mass meeting was held at the London Opera House, organised by the "Daily Express," with the Lord Mayor in the chair, and with Lord Inverclyde, Mr. Pemberton-Billing, and Mr. Basil Peto among the speakers. The meeting unanimously and emphatically demanded a policy of reprisals against Germany. Up to the end of the year this policy had not been put into operation.

On the 20th Lord Montagu delivered a lecture on "The World's Air Routes" at the Central Hall, Westminster, to a large audience, thus helping materially to augment public interest in the future of aeronautics.

On the 26th, during a debate in the House of Lords, Lord Montagu gave a solemn warning to the House on the subject of the neglect of the Flying Services generally, and during that week 27 members of Parliament joined the Parliamentary Air Committee, thus showing that public interest in the Flying Services was rapidly growing.

On the same day Lord Cowdray interviewed the Parliamentary Air Committee and demonstrated to them that much was being done by the Air Board to set right matters of which there was so much complaint. It may be taken that this was practically the turning point in the history of the Flying Services, and that thereafter the work of the Air Board during the previous months began to bear fruit.

On the 27th there was published in this paper an open letter to the Air Board setting forth clearly the reasons for instituting a properly organised system of offensive air raids into Germany.

Incidentally it may be mentioned that this particular issue marked the end of the sixth year of life of THE AEROPLANE newspaper.

On the 28th Mr. Kellaway, Parliamentary Secretary to the Ministry of Munitions, said that we could compel the Germans to stop their raids by retaliating on them.

**Foreign Affairs.**—It was noted early in the month that the Germans, not to be behind other nations in preparation for commercial aeronautics after the war, were establishing a scheme for a Central European Air Traffic system to be organised after the war. It was stated in the Press generally that the first main line to be established would be a Zeppelin route from Hamburg to Constantinople.

On the 13th an official statement appeared in the French Press which stated that Germany intended to put into the fighting line, by the spring of 1918, 3,500 aeroplanes, and would be prepared to replace these at the rate of 600 per cent. per annum for small fighting machines and 400 per cent. per annum for other types.

It was also announced that the first American pilots were to be trained in France for military service, and that French instructors were to be sent to the U.S. to establish training on modern methods in that country.

At the same period it was announced that Capt. Guynemer, of the French Service d'Aviation, had scored 45 victories, thus becoming the "ace of aces" of the French Service. He was also made an officer of the Legion of Honour.

On the 15th it was reported from Washington that Congress had voted 64,000,000 dollars (£12,800,000) for the establishment of the American Flying Services. Many wild figures followed this announcement, but the sum may be taken as the basis for American aeronautics.

## THE AERONAUTICAL HISTORY EXHIBITION IN IRELAND.

On Dec. 22nd the Lord Lieutenant of Ireland opened the Air Services Exhibition in Dublin. Some hours previously the Countess of Drogheda, whose enterprise resulted in the taking of the exhibition to Dublin, aroused a great deal of interest among the citizens by flying over the city in an aeroplane piloted by a Royal Flying Corps officer and distributing leaflets relating to the exhibition.

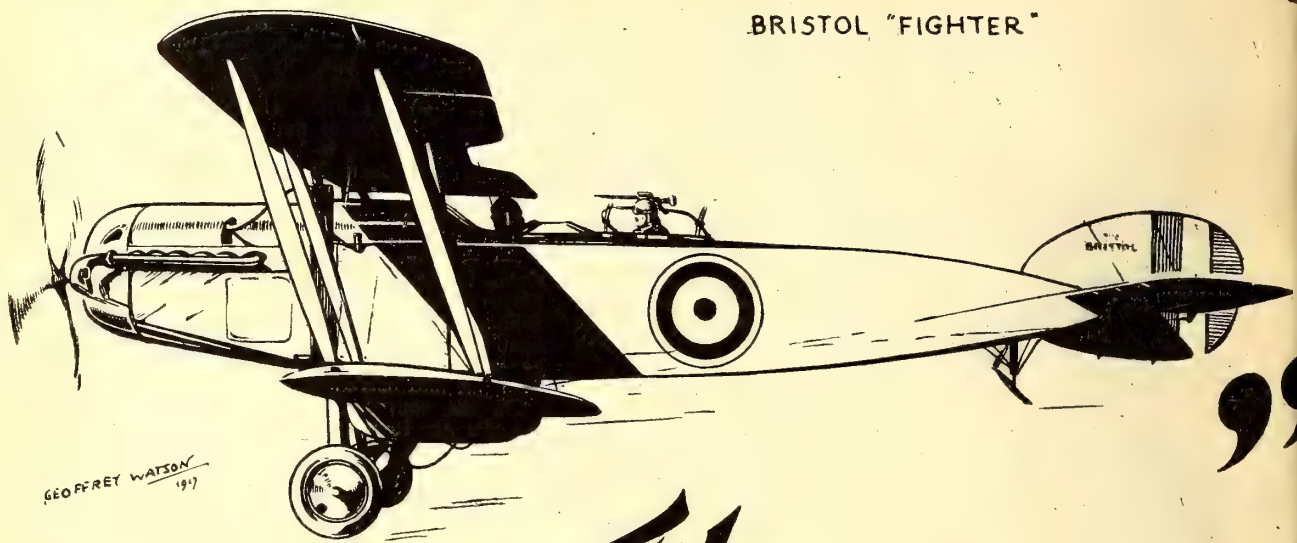
The Lord Lieutenant, in declaring the exhibition open, referred to the part taken by Irishmen in the early triumphs of aviation, and said that there was good reason to suppose that Ireland would soon see a great development of the aviation service. They had an indication that they were to have aerodromes and

an airship station. Ireland, which was the land outpost of the Western world, might in the future form a station for the Atlantic voyage.

[One commends this idea to the authorities. The shore of Blacksod Bay is obviously the proper terminus for the transatlantic lines, and thence the journey to Dublin is over flat country eminently suited for passenger aeroplanes.]

Furthermore the establishment of aircraft works in Ireland is an easy matter as there is an enormous supply of highly skilled labour immediately available in Belfast, and a great deal in Dublin. A scheme for such developments has been on foot for many months, but has hitherto failed to find official approval, the usual fate of anything calculated to increase the industrial value and political peace of Ireland.—Ed.]





# “The Bristol”

THE BRITISH & COLONIAL  
AEROPLANE CO., LIMITED,  
FILTON, BRISTOL.

TELEGRAMS—"AVIATION, BRISTOL."

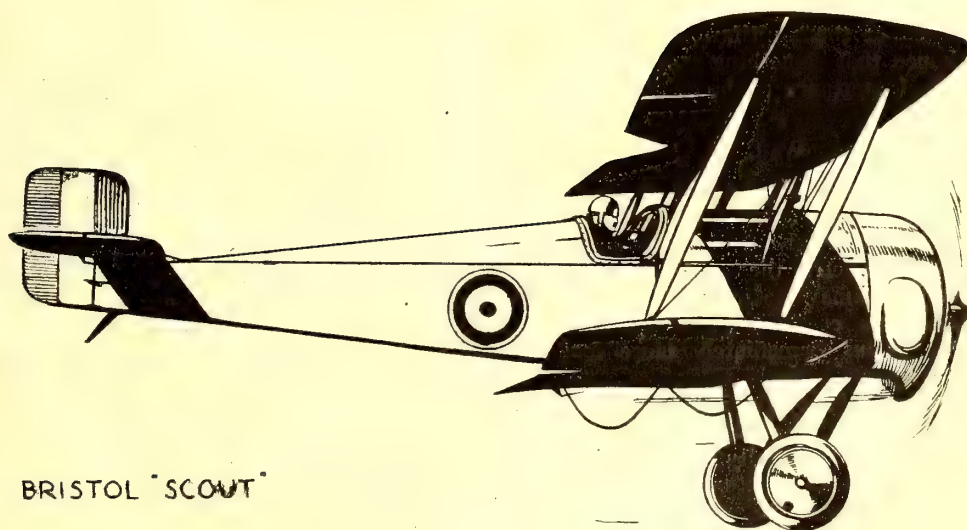
TELEPHONES—3906 BRISTOL  
(Private Branch Exchange)





# Aeroplanes

Contractors to  
H.M. AIR FORCES.

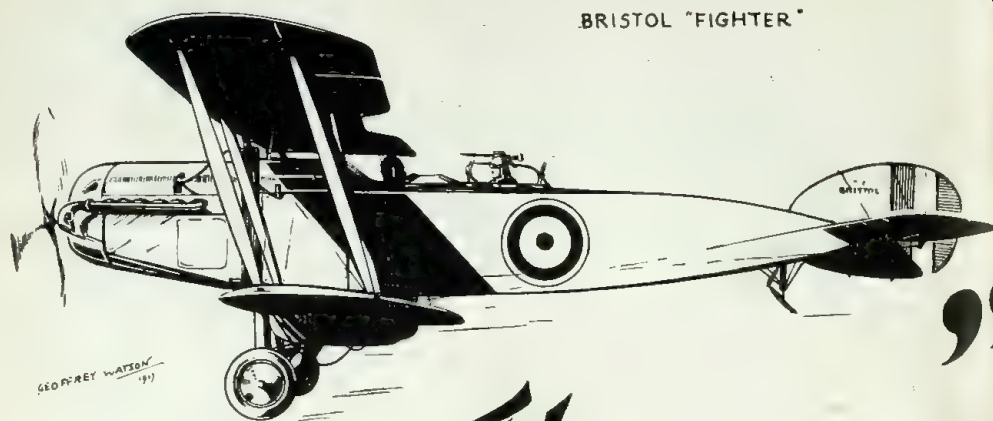


BRISTOL "SCOUT"









BRISTOL "FIGHTER"



# Aeroplanes

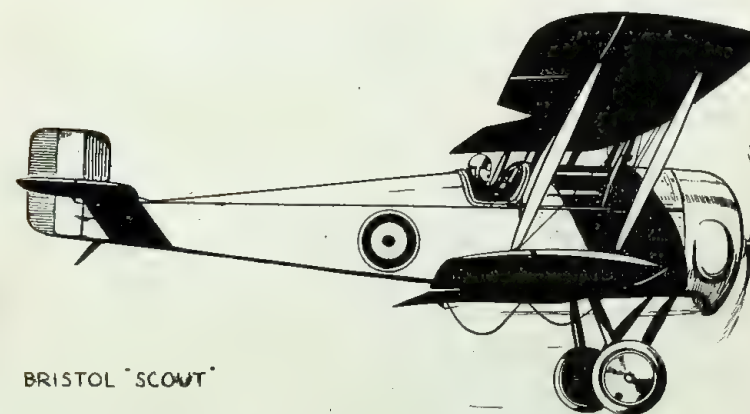
# "The Bristol"

THE BRITISH & COLONIAL  
AEROPLANE CO., LIMITED,  
FILTON, BRISTOL.

TELEGRAMS—"AVIATION, BRISTOL."

TELEPHONES—3906 BRISTOL  
(Private Branch Exchange)

Contractors to  
H.M. AIR FORCES.



BRISTOL "SCOUT"



## ON THE R.N.A.S.

This being the Annual Naval Issue of *THE AEROPLANE*, it seems a fit and proper thing to indicate in some degree the nature of the work of the Royal Naval Air Service, seeing that, despite almost daily communiqués issued by the Admiralty concerning the doings of the R.N.A.S., considerably less is really known to the British Public about the work of the Service than is known to the enemy. The German High Command, naturally, knows far more about the results of such work—excepting always its anti-submarine results—than do our own authorities.

In any other country than England one would be surprised to find that no official effort has been made to afford the taxpayer the opportunity of taking an intelligent interest in the value given him for the money spent on so important a service, but it has never been the custom of those in High Places to enthuse the taxpayer by appealing to his intelligence. The banal poster is supposed to suffice, whether as an inducement to economise in food or to subscribe to war loans.

Possibly in a country where, as a philosopher has said, the Harmsworth Family started "the 'Daily Mail' for people who could not think, and the 'Daily Mirror' for people who could not read," such reliance on banality is justified. But there are those who believe that still more could be done by crediting the taxpayer with a modicum (however much that may be) of intelligence, and by letting him know so much about the internal work of the Services for which he pays as, firstly, is known to the enemy, and, secondly, is calculated to afford satisfaction to the British Public and dissatisfaction to the enemy.

The result of this absurd reticence, or neglect of opportunities, on the part of the Authorities is that most people are still under the impression that all the King's Services are doing less than they are really doing, that many evil things are being hidden, that quite minor operations are boomed in communiqués which sound well and mean little, and that the R.N.A.S. in particular does precious little for its money except go for occasional joy-rides, and walk about looking at a suitable distance like the Real Navy. Nothing could be more unjust to the hard-working officers and ratings of the R.N.A.S. than such an idea, and though in a brief article such as this it is impossible to do more than give a mere sketch of the multifarious activities of the Service, it is hoped that something may be done to convey an idea of the importance of the achievements of 1917.

## ANTI-SUBMARINE WAR.

Though necessarily the least public part of the work of the R.N.A.S., the operations against enemy submarines are perhaps the most important of all its activities, so far as concerns directly the comfort of the British Public. Every submarine sunk, either by R.N.A.S. aircraft themselves or by their co-operation with sea-going vessels, means immediately more food for the people of this country.

Inspection of the Honours List of the R.N.A.S., published elsewhere in this paper, discloses a number of decorations conferred and names specially mentioned for service against enemy submarines. Naturally it is not disclosed which of those officers and ratings pertain to airships, or to seaplanes, or to kite-balloons, but the mere number of names shows quite clearly that a very great amount of work must have been done to earn so many honours.

Summer visitors to the seaside resorts of Great Britain are familiar with the airships and seaplanes

which during the past year have pervaded our coasts to an extent unbelievable a year ago. Seafaring people of all nations, including unfriendly neutrals and even the Germans themselves, are at least as well acquainted with the types of aircraft used on submarine patrols. Doctor MacNamara, speaking on behalf of the Admiralty, has informed the House of Commons ingeniously that we have "a number of low-flying slow-flying seaplanes," suitable for anti-submarine operations, a piece of information which failed to raise even a smile in an assembly which in these days appears to be as ignorant of matters of national defence as it is of self-sacrificing patriotism. Also, it has been officially communicated that at least two of our Naval airships have drifted out of control across the North Sea, and have been sunk in flames by enemy aircraft—presumably aeroplanes from Belgium.

Therefore, Their Lordships of the Admiralty cannot well express their displeasure if one states that anti-submarine operations are at once monotonous and dangerous, whether carried out by highly inflammable airships or by low slow seaplanes. Summer visitors who have seen silvery airships pursuing their stately and smooth course over a summer sea, or have seen seaplanes "skimming the waves"—in the style so inspiring to the minor poet—do not comprehend the extreme discomforts of these operations in unfavourable weather, nor is anything published to indicate how many of our seaplane patrols start gallantly out on their long journeys and never return again, or are only brought back in a state of collapse by patrol boats after long hours—sometimes days—spent in drifting at the mercy of the sea, in a rapidly decomposing seaplane.

## A SEAPLANE INCIDENT.

Only a few days ago a seaplane—apparently of Dr. MacNamara's low and slow type—operating from a wild and rocky coast, went far out to sea on its lawful occasions, and, owing to a strong off-shore wind rising while it was away, only just struggled back to land with its last drop of petrol. It was just after the recent hard frost, and it was nearly as cold as when it was actually freezing. The change in the weather had brought mist with it, and the land was invisible from 1,000 feet five miles out at sea.

One may imagine the feelings of the crew as their petrol gauge showed more and more emptiness while still no land was in sight. Happily their supply held out till they reached the coast, and still more happily they struck a piece of coast where was a narrow cove with a perfect though tiny sandy beach, absolutely sheltered from the wind. The pilot alighted beautifully on a nasty lippy sea, and he taxied his machine cleverly into the cove, despite a nasty cross-wind, which, if his petrol had given out when he alighted, would have driven the machine tail first onto rocks where the crew could not have been reached either from sea or land before they had been smashed and sucked down by the under-tow.

By a clever piece of navigation the machine had reached land only some 15 miles from its home station. It was then too dark to fill up with petrol and fly home, and, as the weather showed signs of changing, so that by next morning's high tide the big seas might be washing straight into the cove, when the machine would inevitably be wrecked, it was decided that the safest thing to do was to send a launch over from the Air Station, and tow the machine off and home in the dark on the midnight tide. So, after all their previous unpleasantness, the crew had to stand by and embark in



the small hours for a two-hour tow in the wind and wet and cold.

One gathers that they reached their station safely, but the incident may serve to illustrate one of the common experiences of those who patrol our sea-ways for the protection of our shipping. And only a few days earlier the pilot of that seaplane had spent some four or five hours, forty miles out at sea, let down by engine failure, very seasick, very lonely, out of sight of land or shipping, till at last picked up by a stray patrol ship. Yet he was out again in his regular turn for the next patrol, and he will go on doing it for the duration of the war, or until he is logged as "missing."

These patrols lack the excitement of air fighting or bomb-dropping or even of artillery-spotting. They call for a calm determination and courage which must be more difficult to maintain than almost any other kind. Therefore the more honour to the men who keep them going. They have at least the satisfaction of knowing that the mere sight of an aircraft of any kind is enough to make an enemy submarine submerge at once, and that if their opportunities of sinking an enemy are not as frequent as they could wish, their mere presence in the air has probably saved more ships than they have saved by the actual sinking of submarines.

#### THE AIRSHIPS.

In an exactly similar way the R.N. Airships have deserved the thanks of the nation. In some ways their risks are not as great as are the risks of the seaplanes, in others their risks are greater. The seaplane, at any rate, is not so liable to drift, against its commander's will, into the reach of the enemy's destroying aircraft, nor is it so liable to be brought down in flames.

The progress made by the airship people during 1917 is truly remarkable, and to none is more credit due than to certain Army officers who transferred before the war with their little Army airships to the Navy. Their Lordships of the Admiralty, and the officers themselves, object to the mention of names other than those whom it is Their Lordships' privilege to honour by disclosing to a more or less interested public, but one cannot refrain from mentioning the loss which the Airship Section of the R.N.A.S. has suffered during the year 1917 by the untimely death in an accident of Lieut.-Col. Clive Waterlow, R.E., one of the pioneers of British aeronautics who worked on the first Army airships with Colonel (now Major General) Capper, R.E., and the late Mr. S. F. Cody.

Colonel Waterlow was killed in the landing of a small airship, which, on reaching the ground, ascended again suddenly, despite the efforts of the landing party, and dragged Colonel Waterlow aloft with it, hanging onto one of the handling lines. He was unable to hold on till the ship descended again, and fell from a height of several hundreds of feet. He was killed on the spot.

Reference to the R.N.A.S. Honours List will disclose the names of other soldiers who have distinguished themselves in connection with Naval airships. The list of D.S.Os. gives the name of one who perhaps more than any other has been responsible for the success of the ships.

Those who have been accustomed to regard airships purely as fair-weather craft would be surprised if they could see the newer Naval airships putting out to sea in the grey dawn in weather which obviously threatens a heavy blow later in the day, or returning

in the teeth of half a gale, hidden from time to time by flying clouds, buffeted by gusts from cliffs and mountains, but steadily ploughing their way through it all to their big sheds, stowed, as a rule, behind hills where they are hidden from the sight of seafarers.

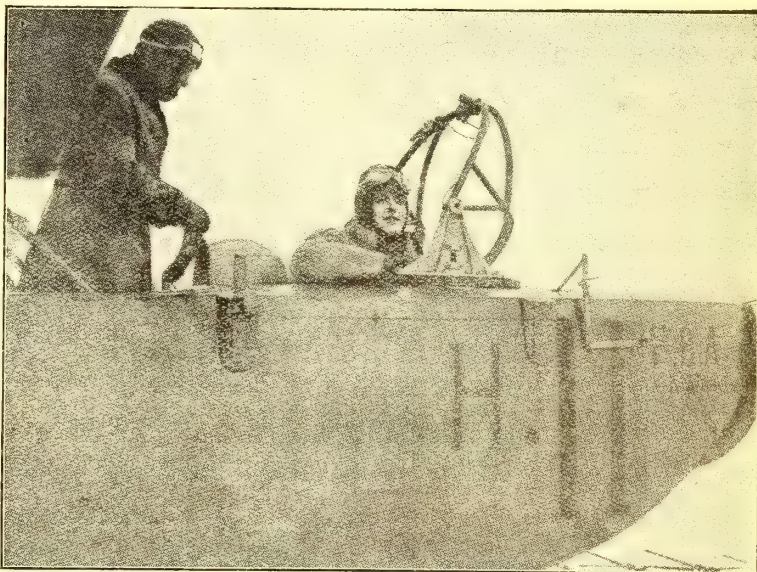
Without in any way committing oneself to a definite opinion one way or other as to the future possibilities of airships in time of peace, one may say without fear of controversion that in sea warfare, both surface and submarine, the airship has more than paid for itself. It would be the height of folly to discontinue airship experiments, for none can say to what extent the airship may develop if those now in control of its warlike uses are allowed a free hand in their experiments, and are not hampered either by the jealousy of those who believe only in aeroplanes and seaplanes, or by the conservatism of those whose only experience is with sea-going craft.

#### THE BIG BOATS.

When the Admiralty representative in the House of Commons was challenged to mention the name of anyone in the R.N.A.S. who had ever produced an aeroplane which had been of use in war the only name he could mention was that of Commander John Porte, R.N. If the challenge had been to mention anyone whose design might have been of use, if intelligently encouraged and assisted officially, he could have mentioned Flight Commander Dyott, whose twin-engined biplane flew well, and ante-dated both the Handley Page and the Gotha. Or if questioned as to future possibilities he might have mentioned the designer of a miniature machine produced by the R.N.A.S. experimental station, though probably he would not have done so. However, as things were, Commander Porte's was the only name available.

Everyone interested in sea-flying, friends, enemies, and neutrals alike, knows of the existence of the Porte Boat, though one hopes that the enemy does not know all the details thereof. It must suffice, therefore, to say that what the Handley Page, the Riesenflugzeug, and the Caproni are to land-going aeroplanes, the Porte Boat is to the seaplane.

From a discouraging American experiment it has become a great British—or rather Irish—success: for Commander Porte is as Irish as if his name had been O'Sullivan, and he comes from the same county. What the Porte Boat has done against submarines and air-



(Reproduced from "Aerial Age.")

The Machine-gun Ring of an F.B.A. Boat.



# Aeroplane and Seaplane Designers and Builders



# SHORT

TELEPHONE - - -  
TELEGRAPHIC ADDRESS -



# BROTHERS



CONTRACTORS TO THE ADMIRALTY.

LONDON OFFICE:

**"WHITEHALL HOUSE,"**

29-30 CHARING CROSS, S.W.1.

REGENT 378

TESTED, PHONE, LONDON."







# Aeroplane and Seaplane Designers and Builders



# SHORT

TELEPHONE . . .  
TELEGRAPHIC ADDRESS -

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

# BROTHERS



CONTRACTORS TO THE ADMIRALTY.

LONDON OFFICE:

"WHITEHALL HOUSE,"

29-30 CHARING CROSS, S.W.1.

REGENT 378  
(TESTED, PHONE, LONDON.)

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



ships, with equal facility, may not be told till after the war, but one may safely say that it has more than made good; it has proved itself one of our most valuable weapons. As an aeroplane it is of exceptional capacity, and as a boat it assures the safety of its crew when a seaplane of the ordinary type would guarantee for them a liquid end.

The Porte Boat is one of the few aerial vehicles which is certain of a future immediately after the war, and no matter how the war may end, for as a means of navigation over the waterways of unorganised countries such as South America, Africa, and Asia, and even many parts of Europe and Australasia, it can be made available at once, while the local people are making up their minds whether to lay out labour on aerodromes for land-machines or not. Pending the arrival of the absolutely reliable aero-engine, the big flying-boat is the solution of the trans-oceanic and trans-marine problem, especially if combined with the "Super-marine" wing-slipping arrangement.

#### THE R.N.A.S. ASHORE.

The shore-going detachments of the R.N.A.S. have fully justified their existence, even if that existence has been illegitimate. Reference to the Honours List will show how the Field-Marshal Commanding the British Expeditionary Force has commended certain squadrons of the R.N.A.S. which have operated with his armies in France, and how certain officers and men have been mentioned in despatches for military efficiency. In air fighting, ever since the Battle of the Somme in 1916, no fighting squadrons have done better than those of the R.N.A.S. attached R.F.C.

Similarly on the Dunkirk Front the R.N.A.S. chasers have done well, protecting the back areas such as Calais and Boulogne from marauding Huns, and attacking and destroying bombing machines starting for and returning from England.

Officially published photographs of Zeebrugge, St. Denis Westrem, and Gontrode bear witness to the excellent results achieved by the R.N.A.S. photographic machines, by the photographic sections which handle the photographs when taken, and by the R.N.A.S. bombers which made it worth while to take the photographs.

#### THE BIG BOMBERS.

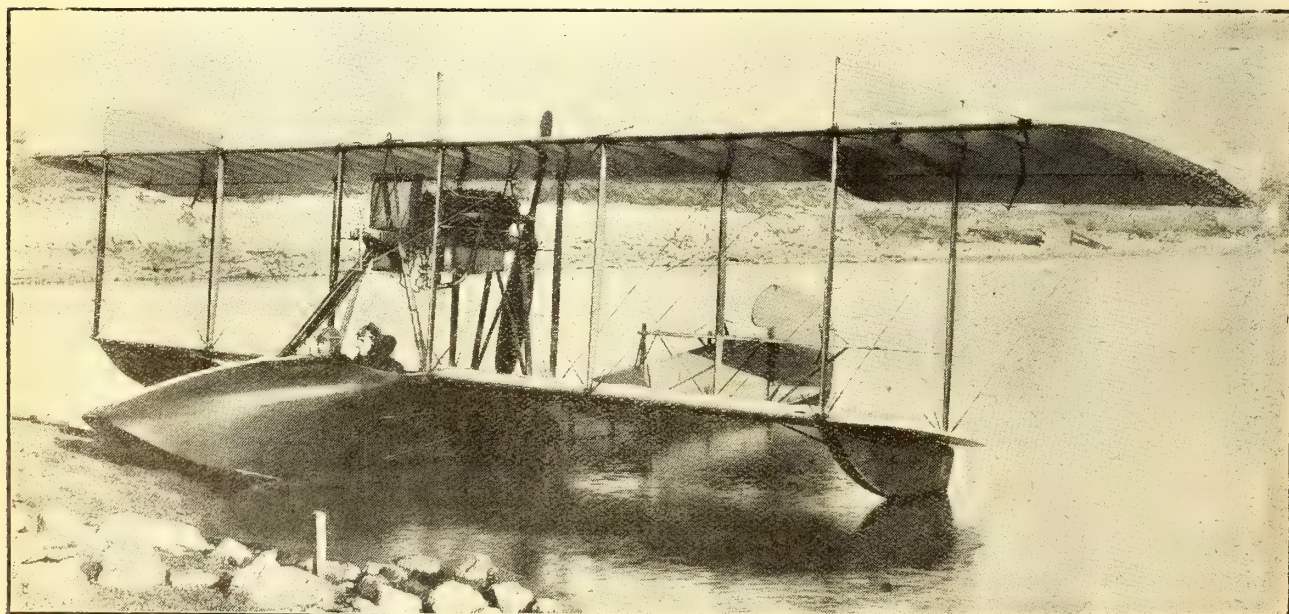
After many months of successful operations on the Dunkirk Front the Powers that Be were convinced that bombing, when properly carried out, was worth while. Possibly certain raids by Huns on London assisted in their conviction, if only by showing what might be done with proper organisation. Sure it is that the systematic bombing of certain German aerodromes in Flanders—which, one gathers, are now called by the Germans, "London Aerodromes," without apologies to Mr. Grahame-White—has saved London many worse things than this city has hitherto suffered. Therefore praise is due equally to those constructors who designed the bombing machines, both the fast and small daylight kind and the bigger and slower night-flying breed, as well as to those officers who stuck steadily to their beliefs, in spite of official opposition and obstruction, and finally organised and made good their attacks on the German bases.

Of this much more may be said if and when the war ends. But it is possible to say that so long as bombing operations have been conducted by people who have studied the subject and know the weapons with which they are working, the results have been very good indeed and the percentage of casualties surprisingly small. Which is very encouraging when one knows how much has been attempted by people whose ideas of organisation and whose knowledge of the new weapon are about equal to an Andaman Islander's familiarity with the Differential Calculus.

#### FARTHER EAST.

It is known to the enemy by their captures, and to the British people by communiqués, that some bombing operations by R.N.A.S. detachments were attempted from Eastern France into Western Germany. A measure of success was achieved early in the year against Offenbach, Freiburg, and other places in Germany suggestive of comic opera. Also Alsace was bombed to some extent.

More recently, when a popular outcry arose for reprisals on Germany, more bombs were dropped in Alsace, and an official communiqué recorded the loss of three R.N.A.S. machines in a raid wherein the quantity of bombs dropped altogether—as officially stated—indicated that six or seven aeroplanes started. Other



A TYPICAL FLYING BOAT.—An American Curtiss Flying Boat. A low-powered edition of the machine which developed into the great flying boats of to-day.



## OVER THE CLOUDS.



*(Photograph by J. M. Petrie)*  
A photograph taken from the front of a Handley Page Biplane while on a trial trip.



features of the attempt, as officially disclosed, seemed to indicate imperfect organisation, and the taking of hasty steps in response to popular clamour.

However, still more recently, on Christmas Eve to be precise, a raid was made on Mannheim in broad daylight which seems to have been a very much more satisfactory affair. Only one machine was lost, and a wholly German city of considerable political and industrial importance was acutely discommoded. A continuation of such good work is eminently desirable, and congratulations are due to the august personage under whose auspices the raid took place.

#### STILL FARTHER EAST.

Still farther east, in the Mediterranean to wit, the R.N.A.S. has continued its submarine chasing, both from shore stations and from seaplane-carrying ships, as in the previous year, but on a larger scale and with better equipment. Also the coast of Syria and Palestine has been harried by seaplanes as in time past, particular attention being given to the Turks' solitary railway where it approaches the coast, as for instance near the island of Mytilene.

Though nothing has yet been said officially, it is fair to assume that the R.N.A.S. assisted in the advance of General Allenby to and beyond Jerusalem, and that Jaffa and Gaza are now comfortable bases for seaplanes instead of being merely their targets. Whatever may have been the part played by the R.N.A.S. in these operations, it is at least certain that the R.N.A.S. detachment operating on that sector was well organised and effectively handled by its commanding officer.

Official communiqués from the French Army of the Orient have constantly recorded the co-operation with the French of British Naval and Military aeroplanes, who, according to the documents, have consistently bombed Porna and Angista. Where those interesting places may be is not explained, but they appear to possess an enduring charm from the point of view of the aerial bomber. The habits of the Greeks suggest that the former is the original home of pornographic prints, and the latter conjures up dimly visions of a species of bitters. One could wish that communiqués were more explicit.

#### A JOYOUS ADVENTURE.

A legend of that distant and irregular war area seems worth recording. It is alleged that at a now somewhat

distant date, by way of marking the cordial co-operation of the two British Services, a composite bombing squadron was formed, half of R.N.A.S. land-going machines and half of R.F.C. machines. Its object was, it seems, to retaliate or reprise on the confederates of Germany for the operations of the first—or Bukharest—Gotha squadron against Salonika.

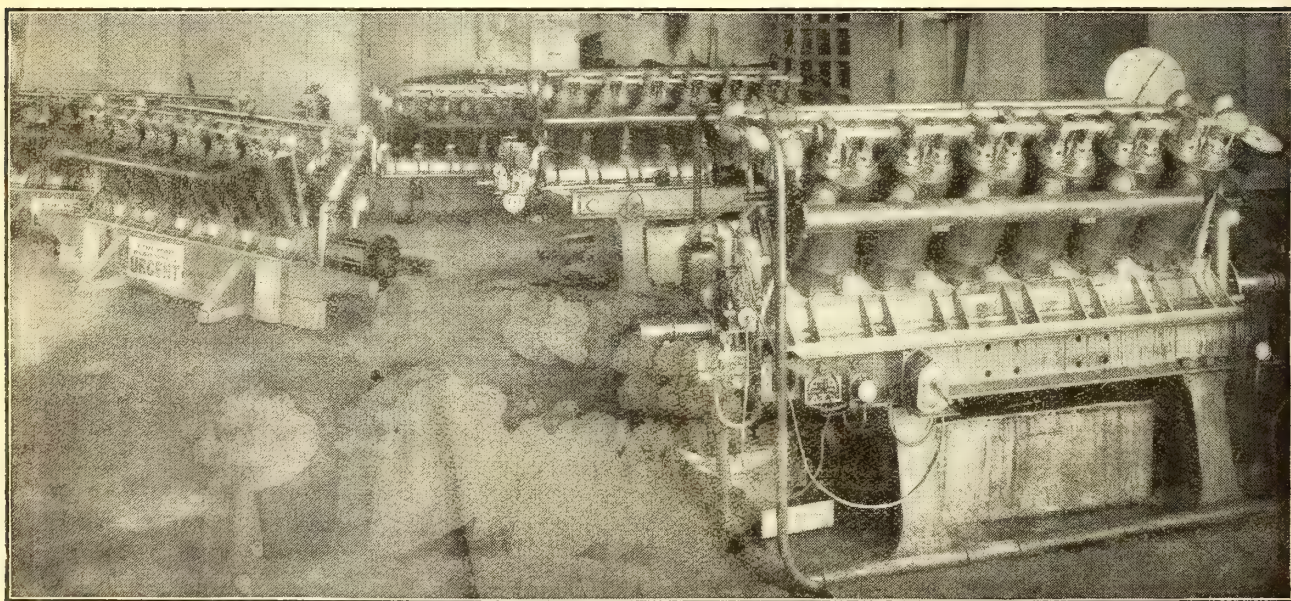
It did much good work, so it occurred to an exalted officer of one Service that it would be a good idea that he and a correspondingly exalted officer of the other Service should go out together and view the reprisory efforts of their juniors. Accordingly, having seen the bombers start, the two high and well-born officers climbed into a B.E.2e, or something equally ferocious, and started after their flock.

And it came to pass that after some twenty minutes' flying the said flock ran slap into a fighting squadron—or *jagd-staffel*—of Germans, who proceeded to set about them in approved style. The bombers were well armed, and put up a gallant fight, from which ultimately they emerged undamaged, practically.

The two exalted spectators, however, could not put up so much as a pocket-pistol between them. To run for home was impossible, for the Germans had the heels of them, and could have shot them down at leisure. There was nothing for it, therefore, but to remain in the fight, and pretend that they were dangerous.

Being without bombs and unarmed, the machine was light and handled easily, so the pilot amused himself by attacking fiercely any German machines within reach. He charged at them and under them and across them and over them in the acrobatic manner of the practised Hun-slayer, and many a German fled at his coming. Meantime the passenger, like Saint Paul off Cyprus, anchored his stern and, *faute des mieux*, sat tight and prayed for the day.

In due course the Huns were beaten off, the bombers proceeded on their way, accompanied by their exalted audience, and presently all returned safely to their base. One dare not indicate who were the senior officers who thus disported themselves by way of light relief from administrative duties, nor to which Service the pilot belonged and to which the passenger, but it is alleged that in landing the under-carriage of the machine was instantaneously and efficiently deleted, as by one with great experience in such matters. Also it is alleged



A GOOD FRIEND TO THE R.N.A.S.—A batch of Green Engines ready for delivery.



that the passenger, on being excavated from the débris, expressed his intention of buying a farm.

It should be noted that this legend is a strong argument in favour of co-operation between the two Services, if not actually of a single combined Service. But it must not be taken as advocating that senior officers should conjointly take the air in their keenness to watch the effects of bomb raids.

#### THE BACK OF BEYOND.

Somewhere east of Suez the R.N.A.S. still continues its work. Little has been heard during the year of seaplanes in Mesopotamia, or on East Africa or elsewhere, and it is probably undesirable that the enemy should know what is being done. Nevertheless, there is a delightful story to be told some day—by Mr. Kipling, one hopes—of a seaplane pilot and his passenger stranded by luck on an entirely savage island, where, while waiting for sea transport for themselves and their machine, they set about civilising the natives in accord with the best traditions of the British Empire.

At the end of many moons they were taken off by a steamer fetched by a stray dhow or felucca or catamaran or junk or some such esoteric craft, which met their island by accident. And it is on record that by the time they left they had taught the chief and his councillors and the tribe in solemn conclave assembled to sing in chorus "Hello! hello! who's your lady friend?" Thus is the boon of Anglo-Saxon culture carried to the ends of the earth by the Empire's fighting men.

#### KITE-BALLOONS.

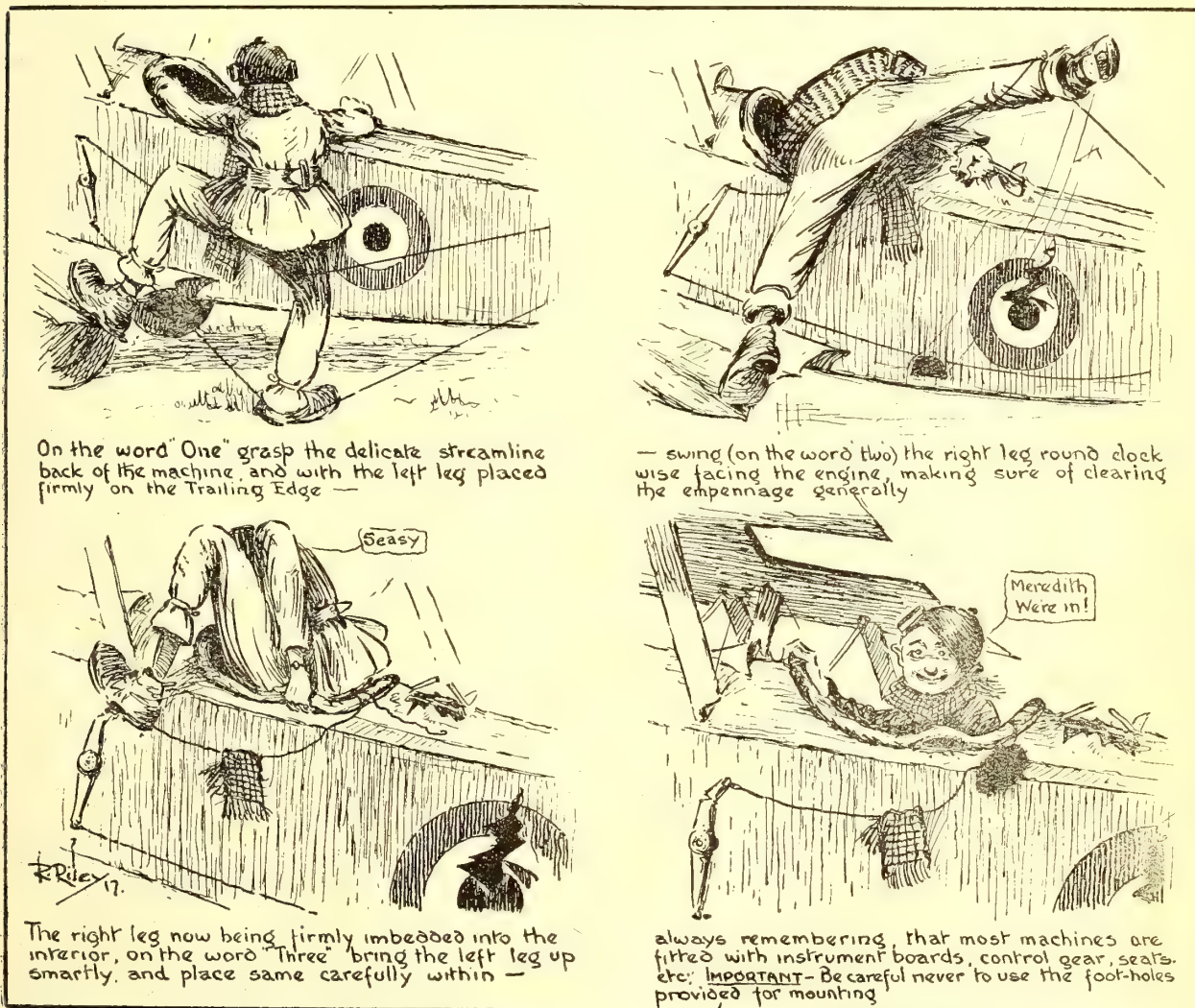
To the R.N.A.S. belongs the credit of having intro-

duced Kite-balloons to the King's Forces, or rather the credit belongs to a soldier seconded to the R.N.A.S. and to an ex-Naval officer who joined the R.N.A.S. early in the war. Much good work was done by the K.Bs. in 1915 and 1916, but their use has been very greatly extended in 1917, in ways which the enemy well knows, and also in ways which the enemy may be left to discover to his cost in due time.

Of their activities, or perhaps one should say their strenuous inactivities, there is little to relate. The stability and therefore the utility of the K.B. has been greatly improved, firstly by Captain Caquot of the French Army and later by British experiments, until the modern K.B. is a far better observation post, and far less strain on its gear than was the old German *drachen-ballon*. Both afloat and ashore the Naval K.Bs. have been of high value to the Navy and to troops with whom they have co-operated.

#### TRAINING.

Apart from its war activities, much good work has been done at home in improving the system of training Naval aviators, observers, wireless operators, gunlayers, mechanics, and other personnel. Discipline and general efficiency has improved to an extraordinary extent during the past year among all ranks and ratings. The difference is striking to anyone who has long been in touch with the R.N.A.S. The Air Service is in no way behind the Navy in the smartness of its personnel, and the discipline is less rigid, with excellent results. The subject of training deserves a special article to itself at some future date.



TRAINING.—A ribald sketch indicating the degree of intelligence shown by some pupils in the early stages of their careers as aviators.



## TECHNICALITIES.

Despite all their mistakes of the past, the technical people of the R.N.A.S. have done good service to the King's Forces during the past year. To them is due entirely the success of our big bombing machines.

Without the strenuous support of a certain able officer of that department, one of the great pioneers of flying in this country, the Handley Page machines would have been turned down, chiefly on the advice of people in offices whose experience of modern active-service conditions is negligible. This was before the reiterated visits of Gothas made the "London Front" of such high educative value to those in offices at home. Similarly the engines which drive that machine and others of our best aeroplanes are due to R.N.A.S. foresight and initiative. It is well to remember that the R.N.A.S. backed the production of the Rolls-Royce, Sunbeam, and Le Rhône engines when the R.F.C. "experts" of the period were staking everything on the R.A.F. engine.

Apart from the encouragement given to the Aircraft Industry by the R.N.A.S. in the past, very much experimental and test work of the highest value has been done at the R.N.A.S. Experimental Station, whose whereabouts must be nameless. The original work done there has produced several very successful and novel types of machines which, if not exactly likely to stop the war forthwith, are, at any rate, sure to alter the outlook of designers in the future quite materially, especially as regards miniature aeroplanes.

## A WELCOME HONOUR.

The appointment of Major-General Trenchard, G.O.C., R.F.C. in the Field, to be Knight Companion of the Bath, will be accepted by officers and men alike as a recognition of the work of the whole Corps. Apart, however, from this general participation in the honour, the Corps will rejoice that the officer who has led them, through good and bad times alike, to their present high state of efficiency has himself received some recognition.

Of Sir Hugh Trenchard it may be truthfully said that he has made the R.F.C. what it is. As Chief of Staff at the Central Flying School he formed the character and established the tradition of the Corps, for nearly all those officers who now hold high commands in the R.F.C. passed through his hands as mere pupils. When at the outbreak of war every trained man in the R.F.C. went abroad with the Expeditionary Force, Major Trenchard, as he then was, remained behind at Farnborough with a number of empty sheds and offices as the sole material on which to build a new Corps. How well he laid his foundations is shown by the pre-eminence of the R.F.C. to-day over all other flying services in the world.

When, later on, he took command in the Field, and left others to develop the plans which he had initiated at home, his administrative powers and his high qualities as a leader of men established the *moral* of the Corps and built up its organisation with results which are to-day patent to all beholders. His ability to inspire confidence in all those under him, and to select subordinate commanders who likewise inspire confidence and achieve success, is recognised by the whole Corps, which very justly considers its G.O.C. to be one of the really big men of the King's Army.

On behalf of all concerned with British Aeronautics one congratulates the R.F.C. on the distinction it has gained by the honour conferred on its leader.

It is of interest to note that practically all the officers in responsible positions at this station can claim to be among the pioneers of British aviation, several of them dating back to 1910, and one at least to 1908, in experience of aeronautical experiments. And it is of not less interest to know that custom has not staled their infinite variety, for their ideas are about as far ahead to-day as they were when flying first began.

## THE FUTURE.

Having thus, one hopes, indicated that the R.N.A.S. at least justifies its existence, one may perhaps hazard a guess that the R.N.A.S. intends to continue to exist as an entity, even if as a kind of Siamese Triplet with the R.F.C. and whatever the third branch of the Air Force may be called. The announcement published this week that R.N.A.S. Observers will wear special buttons and badges, and that an observer may wear an extra half-stripe after eight years' service as an observer (God save his nerve!), seems to indicate that the High Authorities look forward to the R.N.A.S. existing for some time before its final absorption into the grey, pink, or puce uniform of the Air Force—whatever it is to be. At any rate, it seems worth while to take care of existing uniforms.

Thus one is given confidence to assert that the R.N.A.S. will continue to be a purely Naval affair, except in so far as it continues to draw its supplies and partly trained personnel from the Air Ministry pool. Long may it continue to do so.—C. G. G.

## AIR BOARD APPOINTMENTS.

It was officially announced on Dec. 24th that, following the appointment of Sir William Weir as a member of the recently constituted Air Council, and as the Director-General of Aircraft Production in the Ministry of Munitions, the following appointments in the Department of Aircraft Production have been made by the Minister of Munitions:—

Assistant Director-General.—Mr. Henry Fowler, C.B.E.  
Controller of Supply Department.—Lieutenant-Colonel W. Alexander, D.S.O.  
Controller of Technical Department.—Lieutenant-Colonel J. G. Weir.

## AIR BOARD CHANGES.

The Secretary of the Air Board issued the following statement on Dec. 26th:—

A reorganisation of the Technical Department, hitherto under the Air Board, has been carried out by which that department has been transferred to the department of the Director-General of Aircraft Production, which is part of the Ministry of Munitions.

Erroneous inferences having been drawn from the fact that certain officers employed in the Technical Department, as formerly constituted, have been placed, as a consequence of this reorganisation, at the disposal of the Admiralty and War Office, it is notified that the changes in question arose simply from the fact that, under the rearrangement of duties, places for the officers in question no longer existed, and did not imply any reflection on the professional or technical qualifications of those officers.

## A NEW APPOINTMENT.

It was announced on Dec. 28th that Sir Howard Frank has been appointed Director-General of Lands for the Air Ministry.

Sir Howard is also Director-General of Lands to the War Office and the Ministry of Munitions. The whole business of the taking over of lands, their acquisition and renting, management, and the compensation payable in respect thereto will thus be under one control for the three Departments—the War Office, the Ministry of Munitions, and the Air Ministry.

## GERMANY'S AIR SERVICE.

Reuter's correspondent on the British front says that the aviators are restricted in their operations by the bitter cold and the low visibility.

"It is becoming increasingly clear that Germany is experiencing great difficulty in maintaining her Air Service at its present standard of strength and efficiency. Captured enemy airmen are unanimous in stating that the output of new machines has become so limited that only a very restricted proportion of these are available for replacement on the Western front, the remainder being composed of what the British aviators call 'old buses.'"

[Confirmation is lacking, but the facts seem to be as stated.—Ed.]



## The R.N.A.S. Honours List for 1917:

### THE ORDER OF ST. MICHAEL AND ST. GEORGE.

C.M.G.

Capt. CHARLES LAVEROCK LAMBE, R.N., D.S.O.

### THE DISTINGUISHED SERVICE ORDER.

Feb. 16th, 1917.

Flt. Lt. STANLEY JAMES GOBLE, D.S.C., R.N.A.S.

For conspicuous bravery and skill in attacking hostile aircraft on numerous occasions. On Nov. 7th, 1916, he attacked an enemy scout and chased it down to 1,500 ft., when it was seen to land, crash into a fence, and turn over in a field. On Nov. 27th, 1916, he attacked four hostile scouts, one of which he brought down in flames. On Dec. 4th, 1916, on six different occasions during the same flight, he attacked and drove off hostile aircraft, which threatened the bombing machines which he was escorting, one of the hostile machines going down completely out of control.

April 22nd.

Flt. Lt. (Actg. Flt. Comdr.) BERTRAM CHARLES BELL, R.N.A.S.

For conspicuous bravery and skill in attacking hostile aircraft. Since Feb. 1st, 1917, he has taken part in 14 aerial combats, notably:—

On March 17th, 1917, on two different occasions during the same offensive patrol he attacked and drove down hostile machines, one completely out of control and the other in flames.

On March 24th, 1917, he attacked a hostile machine which was diving on one of our machines. After he had fired about 30 rounds at a range of about 50 yards the hostile pilot fell back and his machine went down spinning and side-slipping completely out of control.

May 12th.

Capt. CHARLES LAVEROCK LAMBE, R.N.

For his valuable services in command of the R.N.A.S. units on the Belgian coast; he is very largely responsible for the good service in the varied duties carried out by them against the enemy.

Sqn. Comdr. GEOFFREY RHODES BROMET, R.N.

This officer commanded a squadron of the R.N.A.S., attached to the [Royal] Flying Corps, with conspicuous ability and success. Under his command the squadron developed into a most efficient and formidable fighting force, which has brought great credit to the Royal Naval Air Service.

Sqn. Comdr. EDWARD THOMAS NEWTON-CLARE, R.N.A.S.

During the past year he has led his squadron with conspicuous success in numerous bomb attacks, and on many occasions has engaged and driven down hostile machines.

May 23rd.

Flt. Sub-Lt. JOHN JOSEPH MALONE, R.N.A.S.

For successfully attacking and bringing down hostile aircraft on numerous occasions. At about 6.30 a.m. on April 23rd, 1917, while on patrol, he attacked a hostile scout and drove it down under control. He then attacked a second scout, which, after the pilot had been hit, turned over on its back and went down through the clouds. A third scout, attacked by him from a distance of about 20 yards, descended completely out of control. While engaging a fourth machine he ran out of ammunition, so returned to the advanced landing ground, replenished his supply, and at once returned and attacked another hostile formation, one of which he forced down out of control. On the afternoon of April 24th, 1917, he engaged a hostile two-seater machine and, after badly wounding the observer, forced it to land on our side of the lines.

June 15th.

Flt. Lt. E. R. MOON (now prisoner of war). [Since returned.—Ed.]

Since April, 1916, has carried out constant flights over the enemy's coast, including reconnaissances, bomb-dropping, and spotting for gun-fire in all weathers. Has shown great coolness and resource on all occasions.

June 22nd.

Flt. Lt. CHRISTOPHER JOHN GALPIN, R.N.A.S.

Flt. Lt. HERBERT GEORGE BRACKLEY, D.S.C., R.N.A.S.

In recognition of his services on the morning of April 14th, 1917, when he carried out a raid on Bruges Harbour with good results in spite of difficult conditions. Great credit is due to him for his persistence and determination. He also dropped bombs on Ostend seaplane base on the night of May 3rd-4th, 1917, making two trips.

July 20th.

Wing Capt. EDWARD MAITLAND MAITLAND, R.N.A.S.

In recognition of valuable and gallant work in connection with airships and parachutes. He has carried out experiments at his own personal risk, and has made some descents under enemy fire.

Sqn. Comdr. CHARLES HENRY BUTLER, D.S.C., R.N.A.S.

In recognition of his gallantry on June 5th, 1917, when he fought single-handed two engagements with a number of powerful hostile machines. He attacked six hostile aeroplanes together over the Thames Estuary, and later attacked two off Ostend. On each occasion the machine selected for attack was compelled to dive.

Flt. Lt. BASIL DEACON HOBBS, D.S.C., R.N.A.S.

Aug. 11th.

Flt. Lt. ROBERT ALEXANDER LITTLE, D.S.C., R.N.A.S.

For gallantry in action and for exceptional skill and daring in aerial combats. Since May 9th, 1917, besides having driven off numerous artillery aeroplanes and damaged six hostile machines, he has destroyed six others. On June 26th, 1917, an Aviatik being seen from the aerodrome he went up to attack it. He engaged it and fired a burst at close range, and the enemy machine stalled and went down in flames.

Flt. Lt. RAYMOND COLLISHAW, D.S.C., R.N.A.S.

For conspicuous bravery and skill in successfully leading attacks against hostile aircraft. Since June 10th, 1917, Flt. Lt. Collishaw has himself brought down four machines completely out of control and driven down two others with their planes shot away. Whilst on an offensive patrol on the morning of June 15th, 1917, he forced down a hostile scout in a nose-dive. Later, on the same day, he drove down one hostile two-seater machine completely out of control, one hostile scout in a spin, and a third machine with two of its planes shot away. On June 24th, 1917, he engaged four enemy scouts, driving one down in a spin and another with two of its planes shot away; the latter machine was seen to crash.

Oct. 1st.

(PATROL DUTIES AND SUBMARINE SEARCHING).

Wing Comdr. R. P. ROSS, R.N.

Actg. Comdr. O. H. K. MAGUIRE, R.N.

Nov. 2nd.

(EASTERN MEDITERRANEAN).

Wing Capt. F. R. SCARLETT, R.N.

Flt. Sub-Lt. BERNARD ARTHUR SMART, R.N.A.S.

Nov. 17th.

Actg. Flt. Comdr. R. GRAHAM, D.S.C., R.N.A.S.

For conspicuous gallantry and devotion to duty in air flights and bombing raids. Since the award of a bar to the Distinguished Service Cross, Actg. Flt. Comdr. Graham has carried out five night bombing raids, and attacked and brought down three enemy seaplanes. On one occasion he ascended at night for the purpose of attacking hostile machines, notwithstanding the fact that he had only returned a few hours previously from a successful action with hostile aircraft in superior numbers. He has always displayed remarkable skill and courage.

Actg. Flt. Comdr. P. S. FISHER, D.S.C., R.N.A.S.

For conspicuous gallantry and devotion to duty in air flights and bombing raids. On one occasion, when very heavy fighting took place between eight machines of his squadron and about 20 Albatros scouts, he fought at least six combats single-handed, shooting down one of his opponents out of control. On another occasion, when he was acting as leader of a flight of five machines detailed for an offensive patrol, a general action took place with a number of Albatros scouts, in the course of which Actg. Flt. Comdr. Fisher was wounded whilst fighting with great gallantry. He has shown himself to be a most efficient and plucky flight leader, and has also taken part in numerous night bombing raids in addition to his day fighting.

Nov. 30th.

Wing Comdr. C. LL. COURTNEY, R.N.A.S.

In recognition of his services in command of a wing of the Royal Naval Air Service at Dunkirk. Squadrons attached to his wing have invariably shown a high standard of efficiency, and the success of the fighting squadrons generally is largely due to his knowledge and initiative.

Obsr. Lt. R. W. GOW, D.S.C., R.N.A.S.

For conspicuous gallantry and devotion to duty in carrying out a photographic reconnaissance of the Belgian coast under difficult conditions on Oct. 15th, 1917. Obsr. Lt. Gow has also carried out a large amount of valuable spotting work for H.M. monitors, both by day and night, including the successful operations against Zeebrugge on May 12th, 1917, and against Ostend on June 5th, 1917.

Jan. 1st, 1918.

Wing Comdr. PEREGRINE FORBES MORANT FELLOWES, R.N.

Flt. Comdr. ALEXANDER MACDONALD SHOOK, D.S.C., R.N.A.S.



## THE R.N.A.S. HONOURS LIST FOR 1917.

## A Bar to the Distinguished Service Order.

Jan. 19th.  
The King has been graciously pleased to give orders for the award of a Bar to the Distinguished Service Order of the under-mentioned officer, in recognition of his continued gallantry and distinguished services as a Flying Officer: Comdr. CHARLES R. SAMSON, D.S.O., R.N. (Wing Comdr., R.N.A.S.).

Aug. 11th.  
Sqn. Comdr. CHARLES HENRY BUTLER, D.S.O., D.S.C., R.N.A.S.

For the skill and gallantry with which he attacked a formation of 15 hostile machines returning from a raid on England. Closing on one machine, he engaged it at close quarters. Presently he saw this machine nose-dive, crash into the sea, and sink. Meanwhile, he had engaged a second machine, but broke off the engagement to follow down the first machine. Afterwards he lost sight of the enemy formation and returned to his aerodrome.

Aug. 29th.  
Sqn. Comdr. KENNETH STEVENS SAVORY, D.S.O., R.N.A.S.

In recognition of his services on the night of July 9th, 1917, when a successful attack was carried out against the Turkish-German fleet lying off Constantinople. When the "Goeben," surrounded by warships (including submarines), had been located the attack was made from a height of 800 feet. Direct hits were obtained on the "Goeben" and on the other enemy ships near her. Big explosions took place on board them, followed by a heavy conflagration. The War Office at Constantinople was also attacked, and a direct hit obtained.

Sept. 14th.  
Flt. Lt. (Actg. Flt. Comdr.) ROBERT ALEXANDER LITTLE, D.S.O., D.S.C., R.N.A.S.

For exceptional gallantry and skill in aerial fighting. On July 16th he observed two Aviatiks flying low over the lines. He dived on the nearest one, firing a long burst at very close range. The enemy machine dived straight away, and Flt. Lt. Little followed him closely down to 500 ft., the enemy machine falling out of control. On July 20th, he attacked a D.F.W. After a short fight the enemy machine dived vertically. Its tail plane seemed to crumple up, and it was completely wrecked. On July 22nd, he attacked a D.F.W. Aviatik, and brought it down completely out of control. On July 27th, in company with another pilot, he attacked an Aviatik. After each had fired about 20 rounds, the enemy machine began to spin downwards. Flt. Lt. Little got close to it, and observed both the occupants lying back in the cock-pits, as if dead. The machine fell behind the enemy's lines, and was wrecked. Flt. Lt. Little has shown remarkable courage and boldness in attacking enemy machines.

Oct. 1st.

(PATROL DUTIES AND SUBMARINE SEARCHING).

Wing Comdr. A. W. BIGSWORTH, D.S.O., R.N.

(EASTERN MEDITERRANEAN).

Wing Comdr. J. R. W. SMYTH-PIGOTT, D.S.O., R.N.

Sqn. Comdr. C. F. KILNER, D.S.O., R.N.A.S. (Capt., temp. Maj., R.M.L.I.).

## THE DISTINGUISHED SERVICE CROSS.

Feb. 16th.

Flt. Comdr. WILLIAM GEOFFREY MOORE, R.N.A.S.

Flt. Lt. LIONEL CONRAD SHOPPEE, R.N.A.S.

Flt. Lt. EDWARD ROCHFORD GRANGE, R.N.A.S.

Flt. Sub-Lt. ROBERT ALEXANDER LITTLE, R.N.A.S.

April 22nd.

Flt. Lt. (now Actg. Flt. Comdr.) CHARLES CYRIL ROGERS EDWARDS, R.N.A.S.

Sub-Lt. CHARLES KEITH CHASE, R.N.V.R.

Flt. Comdr. ALFRED WILLIAM CLEMSON, R.N.A.S.

Sub-Lt. JAMES LESLIE KERRY, R.N.V.R.

Lt. (now Lt.-Comdr.) ERSKINE CHILDEES, R.N.V.R.

Flt. Sub-Lt. HORACE ERNEST PHILIP WIGGLESWORTH, R.N.A.S.

Sub-Lt. (now Lt.) ERIC BOURNE COULTER BETIS, R.N.V.R.

May 12th.

Flt. Comdr. BERTRAM LAWRENCE HUSKISSON, R.N.A.S.

Flt. Lt. (now Flt. Comdr.) ARTHUR DENNIS WIGRAM ALLEN, R.N.A.S.

Flt. Lt. (now Flt. Comdr.) BERTRAM CHARLES BELL, D.S.O., R.N.A.S.

Flt. Lt. (now Actg. Flt. Comdr.) FRANK FOWLER, R.N.A.S.

Flt. Lt. FRANK THOMAS DIGBY, R.N.A.S.

Flt. Lt. HERBERT GEORGE BRACKLEY, R.N.A.S.

Flt. Lt. NOEL KEEBLE, R.N.A.S.

Flt. Lt. THOMAS FREDERICK LE MESURIER, R.N.A.S.

Flt. Lt. IRWIN NAHER COLIN CLARKE, R.N.A.S.

Flt. Lt. ROBERT JOHN ORTON COMPTON, R.N.A.S.

Flt. Lt. WILLIAM EDWARD GARDNER, R.N.A.S.

Lt. RUSSELL WILLIAM GOW, R.N.V.R.

Flt. Sub-Lt. PHILIP SYDNEY FISHER, R.N.A.S.

Flt. Sub-Lt. DOUGLAS ALEXANDER HARDY NELLES, R.N.A.S.

Flt. Sub-Lt. ERNEST JOHN CUCKNEY, R.N.A.S.

Flt. Sub-Lt. JOHN EDWARD SHARMAN, R.N.A.S.

Flt. Sub-Lt. WALTER ERNEST FLETT, R.N.A.S.

May 23rd.

Flt. Lt. LLOYD SAMUEL BREADNER, R.N.A.S.

Flt. Sub-Lt. JOSEPH STEWART FALL, R.N.A.S.

June 15th.

Flt. Lt. J. E. BAKER MACLEAN, R.N.

(East African Service.)

Sqn. Comdr. E. R. C. NANSON, R.N.

Flt. Sub-Lt. L. O. BROWN, R.N.

Flt. Lt. N. G. STEWART-DAWSON, R.N.

June 22nd.

Flt. Comdr. PHILIP LESLIE HOLMES, R.N.A.S.

Flt. Sub-Lt. (now Actg. Flt. Comdr.) HERBERT GARDNER TRAVERS, R.N.A.S.

Flt. Lt. EDWARD J. COOPER, R.N.A.S.

Flt. Sub-Lt. CHARLES REGINALD MORRISH, R.N.A.S.

Flt. Sub-Lt. HENRY GEORGE BOSWELL, R.N.A.S.

Flt. Lt. CHARLES LANGSTON SCOTT, R.N.A.S.

Flt. Lt. WALTER TRAVERS SWIRE WILLIAMS, R.N.A.S.

Flt. Lt. THOMAS GREY CULLING, R.N.A.S.

Flt. Lt. FRANCIS DOMINIC CASEY, R.N.A.S.

Flt. Lt. CHARLES ADRIAN MAITLAND-HERIOT, R.N.A.S.

Sub-Lt. JOHN ROLAND SECRETAN DEVLIN, R.N.A.S.

Sub-Lt. RUPERT FORBES-BENTLEY, R.N.V.R.

Flt. Sub-Lt. LEO PHILIP PAINE, R.N.A.S.

Flt. Sub-Lt. ROBERT LECKIE, R.N.A.S.

Flt. Sub-Lt. BASIL DEACON HOBBS, R.N.A.S.

Flt. Sub-Lt. CHARLES MCNICOLL, R.N.A.S.

Flt. Sub-Lt. VALENTINE EDGAR SIEVEKING, R.N.A.S.

Flt. Sub-Lt. HAROLD THOMAS MELLINGS, R.N.A.S.

Flt. Sub-Lt. FREDERICK EARLE FRASER, R.N.A.S.

Flt. Lt. (Actg. Flt. Comdr.) CHARLES DAWSON BOOKER.

Flt. Lt. GEORGE GOODMAN SIMPSON.

July 20th.

Lt. JOHN JENKINS, R.N.R.

Lt. JOHN KERR, R.N.R.

Flt. Comdr. JOHN CALLAGHAN BROOKE, R.N.A.S.

Flt. Comdr. THOMAS FRANCIS NETTERVILLE GERRARD, R.N.A.S.

Flt. Comdr. REGINALD FREDERICK STUART LESLIE, R.N.A.S.

Flt. Lt. GUY DUNCAN SMITH, R.N.A.S.

Flt. Lt. RAYMOND COLLISHAW, R.N.A.S.

Flt. Sub-Lt. NORMAN RICHARD COOK, R.N.A.S.

Flt. Sub-Lt. ROBERT FREDERICK LEA DICKEY, R.N.A.S.

Warrt. Officer (2nd Grade), FRANK HENRY WHITMORE, R.N.A.S.

(FOR SERVICES IN ACTION AGAINST ENEMY SUBMARINES).

Flt. Lt. JOHN EDWARD ALFRED HOARE, R.N.A.S.

Flt. Sub-Lt. WILLIAM LOUIS ANDERSON, R.N.A.S.

Aug. 11th.

Flt. Comdr. ALEXANDER MACDONALD SHOOK, R.N.A.S.

Flt. Lt. ARNOLD JACQUES CHADWICK, R.N.A.S. (since reported drowned).

Flt. Sub-Lt. ALBERT JAMES ENSTONE, R.N.A.S.

Flt. Sub-Lt. LANGLEY FRANK WILLARD SMITH, R.N.A.S. (since missing).

Flt. Lt. CECIL HILL DARLEY, R.N.A.S.

Flt. Sub-Lt. (now Flt. Lt.) JOHN EDWARD SCOTT, R.N.A.S.

Flt. Sub-Lt. ELLIS VAIR RIED, R.N.A.S. (since missing).

Flt. Sub-Lt. EDWARD ROBERT BARKER, R.N.A.S.

Flt. Sub-Lt. ROWAN HEYWOOD DALY, R.N.A.S.

Flt. Lt. REGINALD RHYS SOAR, R.N.A.S.

(FOR SERVICES AGAINST SUBMARINES).

Flt. Lt. WARREN RAWSON MACKENZIE, R.N.A.S.

Aug. 29th.

Flt. Lt. HENRY MCCLELLAND, R.N.A.S.

Lt. PERCY TOWNLEY RAWLINGS, R.N.V.R.

Flt. Sub-Lt. LACY NORMAN GLAISBY, R.N.A.S.

Flt. Sub-Lt. (Actg. Flt. Lt.) ALFRED WILLIAMS CARTER, R.N.A.S.

Flt. Lt. LANCELOT GIBERNE SIEVEKING, R.N.A.S.

Flt. Sub-Lt. JOHN ROY ALLAN, R.N.A.S.

Obsr. Lt. RONALD GEORGE ST. JOHN, R.N.A.S.

Sept. 14th.

Flt. Lt. (Actg. Flt. Comdr.) ROBERT JOPE SLADE, R.N.A.S.

Flt. Lt. (Actg. Flt. Comdr.) WILLIAM MELVILLE ALEXANDER, R.N.A.S.

Flt. Sub-Lt. CHARLES PHILIP OLDFIELD BARTLETT, R.N.A.S.

(FOR SERVICES AGAINST SUBMARINES).

Flt. Lt. (Actg. Flt. Comdr.) OSBORNE ARTHUR BUTCHER, R.N.A.S.

Flt. Lt. JOHN OSBORNE GALPIN, R.N.A.S.

Lt. JOHN HENRY BLYTH, R.N.R.

Flt. Sub-Lt. CHARLES LESLIE YOUNG, R.N.A.S.

Oct. 1st.

(PATROL DUTIES AND SUBMARINE SEARCHING).

Flt. Comdr. G. F. BREESE, R.N.A.S.

(Continued on page 93).



# **VICKERS LIMITED**

Aviation Department,  
Imperial Court, Basil Street,  
KNIGHTSBRIDGE, S.W.

## **Aircraft**

Telephone :  
No. 6810 Kensington (2 lines)  
Telegraphic Address :  
Vickers Ltd, Knights, London

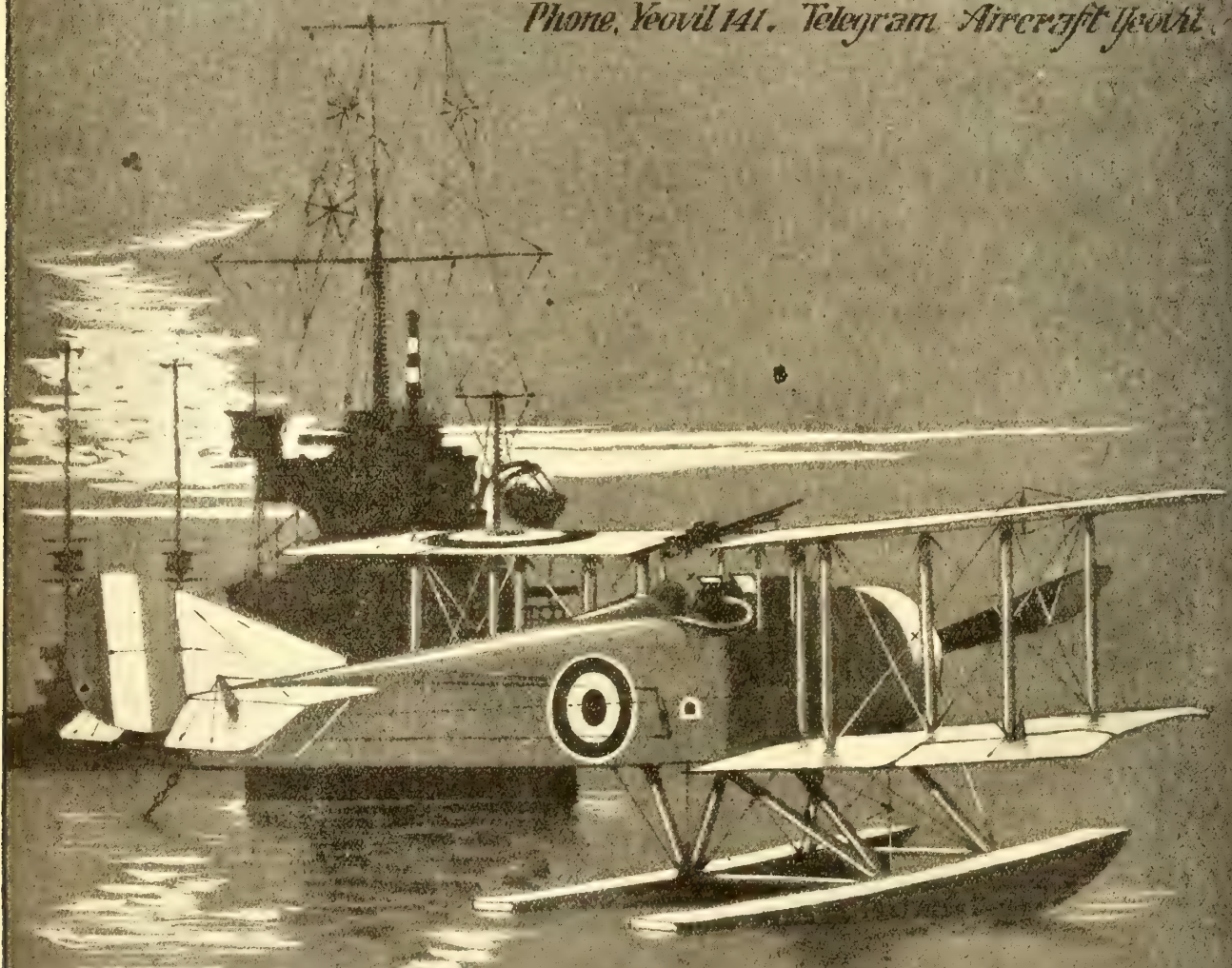
Contractors to the  
**WAR OFFICE and  
ADMIRALTY**



# WESTLAND Aircraft.

WESTLAND AIRCRAFT WORKS  
BRANCH OF PETTERS LIMTD.,  
YEovil.

*Phone, Yeovil 141. Telegram Aircraft Yeovil.*



HARMAN ADV. CO.,



# WESTLAND AIRCRAFT WORKS

---

were neither Converted, nor Adapted, but were Created solely for the Production of Aircraft. Prior to August, 1915, our Site was a Peaceful Pasture, to-day it is covered with Buildings in which we construct Aircraft for Land and Sea. Within the Works Enclosure we have laid out a first-class Aerodrome, and our Land Machines are actually delivered by Air direct from the Works to the Battle Area.

This Establishment has been brought into being, manned and equipped without in any way interfering with the organisation, capacity, or production of the old established Engine Works of Petters Limited.

We cannot execute Private Orders for Aircraft at present, but we desire to keep our name before prospective buyers, and we feel sure that the official Reputation which we enjoy with the Air Forces for the production of War Machines will recommend us for some portion of the Commercial Business which will be in the Market at the conclusion of the Great War, and also for a continuance of Official Orders.

---

## Branch of PETTERS Ltd., YEOVIL.

Telegrams: "AIRCRAFT, YEOVIL."

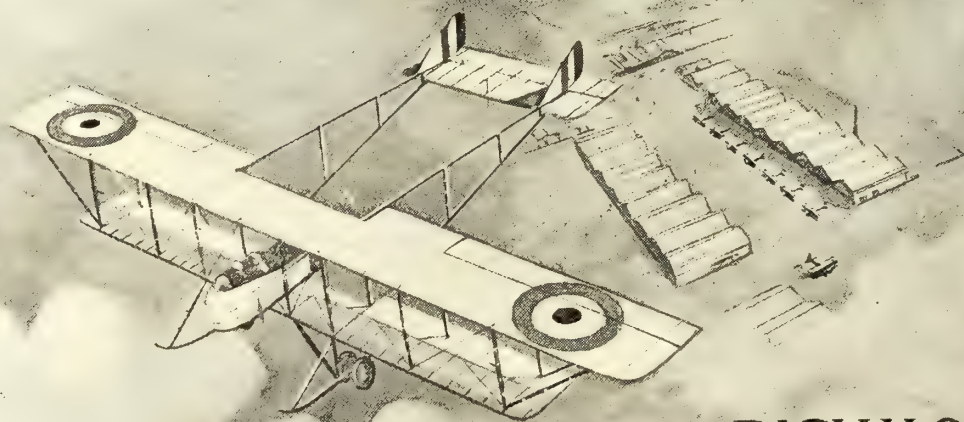
Telephone: YEOVIL 129



# WHITEHEAD



# AIRCRAFT



GEORGE WATSON 1917

**RICHMOND**  
SURREY



# AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER

## The British Aircraft Industry.

(SECOND SERIES.)

BY R. P. HEARNE.

### I.—ROLLS-ROYCE, LTD.

One of the most remarkable, and, indeed, romantic transformations occasioned by the war concerns the Rolls-Royce organisation. Up to August, 1914, the Rolls-Royce firm was completely absorbed in making the most expensive and luxurious motor-cars in the world. Suddenly they were asked to help the nation in its gravest emergency, and, behold, the "luxury" cars adapted themselves most successfully to the trials of the war, and the "luxury" motors formed the basis of engines which were soon destined to become famous in aerial warfare.

I lay stress on the word "luxury," for I wish to bring the point to the notice of the many glib reformers who would sweep away all the things which they deem to be luxuries. A work of art, a piano, an aeroplane, and, indeed, any costly piece of mechanism may be labelled a luxury by many people. It was not so long before the war that motor-cars were called rich men's toys, and aeroplanes were regarded as dangerous freaks.

Judged solely by its price the Rolls-Royce car was a luxury, but when one came to inquire into the cost of production, and the extraordinary care given to the perfecting of every detail, one rightly concluded that it was a work of art, which could not be judged wholly by the market price.

#### THE ARTIST-ENGINEER.

To my mind, one of the best things in British engineering is that we have a certain class of man who cares more about getting the best out of an article than he does about getting the most money out of it. These men are artists rather than commercial engineers, and in motor engineering Mr. Royce, the designer of the Rolls-Royce, is a fine example of the engineering artist.

Many people carped at the amount of care bestowed on the production of the Rolls-Royce car, and they pointed to cheap American cars which sold at a tenth of the price. The cheap cars undoubtedly serve a useful purpose, just as cheap pianos and cheap literature serve, but the true test of culture in a man is when he yearns for the best in whatever pursuit he follows. Almost every man has the artistic craving for high quality in respect of some taste or other, no matter how poor he may be. There would be little progress if we all rested content with articles because they were cheap.

#### THE DANGER OF STANDARDISATION.

In most cases cheapness is arrived at by the most rigorous

standardisation. No deviation from a fixed pattern is allowed, and consequently there is often complete stagnation of design. I need not demonstrate how dangerous this policy would be in aeroplane or air motor practice, especially when we are at war with a foe like Germany.

I dwell on this matter, for I wish to bring out how precious it is for us as a manufacturing nation to possess men with the souls of artists rather than of shopkeepers. If we had not had at hand many high-grade firms of engineers who took pride in their handiwork, we should not have forged ahead as we have done in aircraft technique.

#### STRIVING FOR THE BEST.

And now to show the outcome of striving to get the best out of an article even though the high cost of production limited the sales. Rolls-Royce, like other high-class British firms, were fortunately able to find people who liked to have the best, and also people who liked to imitate the people who liked to have the best. Mr. Royce, as the designer of the Rolls-Royce car, was good artist enough not to run up the cost by fitting gold-plated cylinders or diamond-studded sparking plugs. He aimed at the sound qualities of high efficiency, great reliability, and delightfully smooth running.

These may sound small things in days when we hear of machine-made motors which are assembled almost as quickly as sausages can be filled. But the supreme test of war showed how great was the need for high efficiency, and we discovered more clearly than ever before how essential it was to get the best in machines as in men.

Mr. Royce was asked by the Government late in 1914 to build officially designed engines for aeroplanes. He declined the honour. And then, as if to justify his action, he designed the Rolls-Royce aero-engine. Events have proved how right he was, for within a very short period the new motor had made its name.

#### A QUICK METAMORPHOSIS.

The extraordinary part of the affair is that this engineer should start late in an absolutely new branch of motor engineering, and almost at one leap come into the very front rank of aero-engine makers. The discerning reader will now understand why I laid such stress on the governing principles which control the Rolls-Royce and other high-class British engineering firms. We have several remarkable instances of factories quite new to aero-motors taking up the work at short notice and achieving brilliant success. The whole secret of the matter is that the responsible men



Mr. Claude Johnson.



had been attaining high efficiency in their own particular jobs. I cannot go into details with regard to the Rolls-Royce aero-engine, but little need be said as to its wonderful powers. If I were allowed, however, to quote the latest records achieved by its aid in speed and climbing, they would astonish many people, the Germans included.

#### THE NEW AERO-ENGINES.

I may say that two types of engines are built. The large one is known as the "Eagle," and gives about 350 h.p. The smaller is the "Falcon," giving 250 h.p. Both are of the V type, with two banks of six cylinders. To a person familiar with the six-cylinder engine of the Rolls-Royce car the new air engines are most interesting, as he can trace their evolution, and yet discover the many important new features which have ensured success in air work.

The Germans would be disquieted if they knew the present output of the Rolls-Royce engines, for the firm has risen splendidly to the occasion in the matter of production, despite the scrupulous care devoted to the testing of every part. I may reveal a little secret in saying that there is no mystery about the design of the Rolls-Royce engine. Its success is based on intense attention given to every detail, and to ceaseless striving after further improvement.

The time and money spent on experimental and research work in the Rolls-Royce factory are prodigious. Mr. Royce attains his results by getting a number of little improvements from every part which can be improved upon. He scraps and alters until he can squeeze out no further improvement in the design. So, too, with the material, he tests and searches until the best all-round material is found. So, again, with workmanship, he sets very high standards, and by excellent organisation keeps them up.

And he is practical enough not to let his factory degenerate into an experimental shop. A thoroughly good article is produced under sound commercial conditions. There is no needless chopping and changing, and output is well maintained.

#### THE MEN AT THE WHEEL.

Two men built up the Rolls-Royce business. Mr. Royce is the

engineer and technical organiser, and Mr. Claude Johnson is the business controller. It required very high commercial ability to make a market for the most expensive car in the world, for the Rolls-Royce Company came into the field rather late in the day, and at a period when the German Mercedes and other foreign marques were the favourites in high-priced cars.

Mr. Claude Johnson's commercial triumph in establishing a market for the Rolls-Royce was no less great than Mr. Royce's triumph in making a car worthy of its position, and in keeping it there in the face of world-wide competition.

It is not surprising, therefore, to find that in the war Mr. Johnson has rendered great service, though it must be said that our governors lost much precious time in utilising his abilities.

#### OUR ALLIES' BENEFIT.

I have referred to how the Rolls-Royce Company came into aerial engineering, and Mr. Johnson played an important part in carrying the affair through.

So impressed were the authorities with the work of the Rolls-Royce Company that when America came into the war and decided upon a gigantic air programme, they asked Mr. Johnson to go to the States and help.

This was a high but a well-deserved compliment. Mr. Johnson has taken up the work in characteristic fashion. He has brought a staff of Rolls-Royce engineers with him to America, and he has freely laid before the American authorities the complete details of the Rolls-Royce air engines. In a whole-hearted fashion these British engineers are giving to their American Allies the full results of their war experience in air-engine work, and I have good reason for believing that the Rolls-Royce assistance and advice have been of incalculable value to our Allies.

Associated with Mr. Claude Johnson is his brother, Mr. Basil Johnson, who has had a very wide experience in the motor industry, and who in the early stages of the war did excellent organising work in the R.N.A.S. When Rolls-Royce became busy on war aerial work Mr. Basil Johnson could no longer be spared by his company, and he now looks after affairs at home whilst his brother is abroad.

## CHAOS.

### A PLEA FOR UNIFORMITY IN DRAWING OFFICE PROCEDURE.

BY A SUB-CONTRACTOR.

I am human. I have a head wherein reposes, or so I am led to believe by those who should be competent in their information, a certain amount of grey matter, for which the name is brain. And this is held to be the centre and the seat of that materialistic medium via which such intelligence as I am endowed with finds means of expression.

And also—the point is material—I am of an age when both the attribute and the organ may validly be reckoned as past the period of what I will call capacious development.

Not that they are aged to the actual point of being tangibly worn out, nor are they totally incapable of further saturation, but rather from their growing fullness arises a stiffening of (shall I say?) their resistance to free receptivity.

The sum result of this state is manifest in a sense, gradually strengthening, of impotent protest on those occasions when calls are made on their services which are, or appear to be, in excess of bare necessities.

Nor, do I think, does all this represent a peculiarity of my own. Rather, I am inclined to believe, and my impression is grounded on a fairly extensive contact with kindred human entities, that it is a growingly common symptom of overloading, if not arising from, at least accentuated in its course by, the need—at first gradual, but now nearly complete—enforced on a protestant community, of reforming and re-establishing in ways divergent and far removed from a long accustomed groove.

Perchance, in thus opening with a penned expression of my own personal woes, I may even succeed in striking a responsive chord in you, my dear reader. Who knows! A grumbler with the luck, or the face, to achieve publicity for his growl, will sure, since it is the way of the world, strike supporting echoes, if only from some whose similar grievance, new grown, is sprung instant from the prompt recognition of symptoms hitherto but vaguely manifest.

Which psychological effect achieved, this is doubtless the moment to insert a few forceful words telling my high opinion of So-and-So's Brain Tonic. But since I am committed by my headline to strike another métier, I will straight now confess that so far my garbled recital is but an admission of a deficiency which—you must judge the point for yourself—seems to justify my publicly decrying imperfections in others and their works.

Returning to the personal note, and to define within bounds

the hitherto obscure burden of what is threatening to become all too profuse in non-essential verbiage, I am concerned in the management of a manufacturing establishment, which, caught in the vortex of war-time revolution, has lately found a source of employment in the production of aircraft component parts.

Again, note that the situation is in no way peculiar, but rather one of increasing generality.

#### "DRORINGS."

In the connection just mentioned it is a necessary item in my daily repertoire, to receive for translation into material form, various productions of sundry draughting offices. To accomplish which, first must be acquired a perfect understanding to enable me to see in that which I have before me—the sketch—something which I have not, namely, the point of view, the ideas, and the ideals, of the artist who originated it.

And, since, as mentioned, the examples are sundry, and their sources various, it is the acquirement of this understanding which seems to lay a burden on the workings of my poor intellect, which at times, from their un-uniform means of expression, appears unnecessarily overworked.

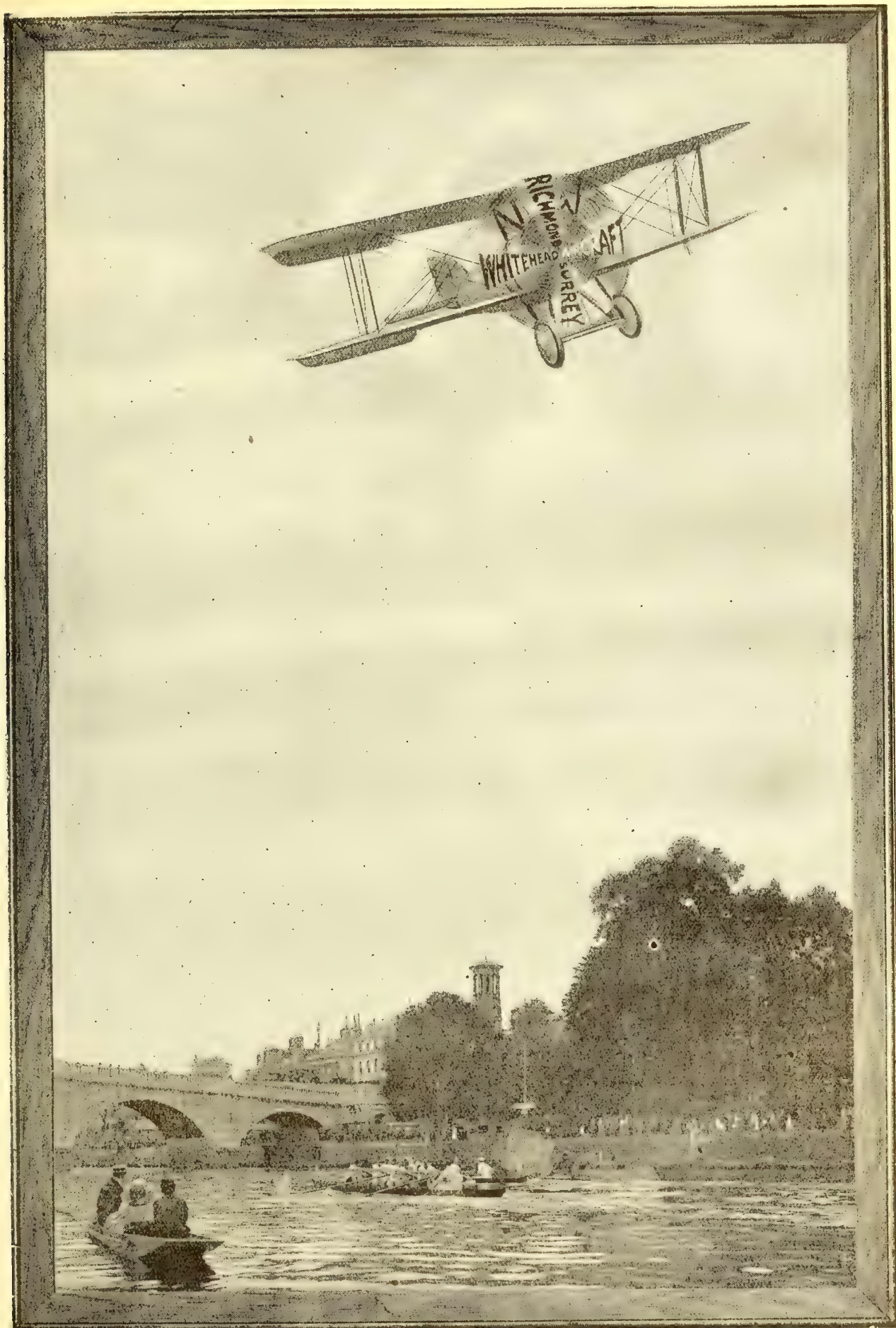
Of the beauteous lines of these prints there is no query, nor have I aught but reverence for their undoubted accuracy. That the thing as drawn will adequately perform its function, if accurately translated, I make no question, and even if it should happen that it does not so justify itself, still should I feel no anxiety, since I am concerned only with producing to the details and instructions set out.

But, oh! headaches and wasted hours! What of the figuring and the glorious uncertainty it bears? Of the fives that can be read for S's, and the nines that turn out to be O's. A grouse this, in passing, for the answer at any rate is only one of two, and as a sporting proposition, the odds, since even, are naught for a punter to cavil at.

But worse, far worse—generally plainly readable and for this reason the more puzzling—the plusses and the minuses (or should the plural of this be mini?) the A's and the B's and the X Y Z's. The dimensions and remarks which are underlined and more which are not.

Is the lining with meaning, or for emphasis, or is it merely ornament without which the eye-able balance of the thing would be upset? And the hieroglyphics and Chinese characters—ah!





KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



here we have something deep. What it is, is it? Beware, there's a catch in it. Better have this referred to a superior Officer-in-Charge (Light—on a dark subject—Brigade).

And then, the tolerance figures—a dream. Sometimes Plus 2, minus 1, plus 3, equals overall plus 3. How does it work, or has the date to be added—I've a friend who's a waiter and he does funny things at times with his bills that way.

Now, mind you, I've no doubt whatever—and if only for this reason you need have none either—that the superman who draughted each of the things knew all about it. Oh, ay! It's all as clear as the Air Ministry Bill to him, and perhaps, equally like, is, of intention, a very open and undeterminate quantity.

But, seriously, I do think, and the suggestion is put for the careful assimilation of all draughting office experts, the feelings of us poor sub-contractors, sub-sub-contractors, and sub-sub-sub, etc., should receive a little consideration, or should I say our more plebeian intellects should receive the allowance they demand.

#### THE RUDDY LIMITS.

Why should one designer call for  $\frac{0.007261 \text{ in.}}{0.007262 \text{ in.}}$  } when another wants 0.0072615 in. {  $\frac{\text{minus } 0.0000005 \text{ in.}}{\text{plus } 0.0000005 \text{ in.}}$  } --and yet a third asks for 0.007263 in. XYZAB? After digging through the "Pink 'Un," "Old Moore's Almanack," "Bradshaw," and any other highly technical volumes that are kept to hide the faded office wallpaper, the discovery is made, first, that they all mean the same thing, and, second, that meanwhile the sub-sub-contract has been placed elsewhere, the stuff made and worn out, and the machine type—since ninety-nine years have now elapsed—is practically officially obsolete.

#### INTOLERANT TOLERANCE.

And, even allowing that, if the war lasts long enough, this sort of problem can be solved, what about those tolerance figures which don't add up right? If the allowance from A-B is plus or minus 2. B-C the same, but from A-C overall one is only given plus or minus 3, what, oh! what, will the A.I.D. man do, if A-B and B-C are each made plus 2 (and therefore within the allowance), when he finds that A-C is plus 4, but all the while the drawing says it should come out at 3? Really, is it fair to strain his authority for making decisions quite so far?

In case I have not yet mentioned this point, will some kind reader versed in legal law or lore inform me whether sufficient justification exists to tone a murder charge down to manslaughter if it should ever happen that some day I meet the originator of a print which for downright diabolical, blood-thirsty, cold and calculated spite, certain sure takes the whole confectionery stall?

I have this specimen in front of me now, covered with a piece of non-flamoid to tone down the harshness of its barbarity. In the words of my leading charge-hand—"It's a 'pup.'"

The dimensions, of which there are quite a number, have divided their favours about equally between millimetres and inches. There is a hole through a boss which is "umpty" millimetres, and the diameter of this boss is "ditto" inches, so apparently the thickness of wall in the boss round the hole is intended to be

	Umpty inches.
Minus ...	Ditto millimetres.
Equals ...	Grey hairs.—Mine.

There are holes to drill, some "nth" of an inch, and another row "something" millimetres, with an "A" attached (and evidently seconded for duty for the duration).

One other dimension states fully the high and low sizes, and, really, twixt you and me, it's a great pity the whole thing is not a bit bigger—it couldn't be more complicated—then it might have served as a draughtsman's "Vade Mecum" or "Glossary of Terms."

#### THE STAR TURN.

Well, I'm open to tackle almost any job my men will take on without threatening to strike, and, in fact, I am, or at least I WAS, blessed with one man who was a fair marvel. He stuck to me because he was twenty-two, unmarried, and classed A1, and he had not his protection card, Red or Black. He could—when the fit struck him—which was apparently only once or twice *per war*—wangle the star handle and feed levers of his 72 ft. by 7 ft. 6 in. by 3 ft. 9 in. sliding, surfacing, screw-cutting, semi-demi-automatic turret milling machine, at such a pace that we actually had to put a water-cooling system complete with radiators round his joints to prevent them from overheating.

When I showed him this "drowing" and the necessary complement of English and Metric Micrometers and gauges, his insubordination, the first and the last, took the form of—"Guvnor! D'yer think I'm Cinquevalli?"

He's a full private now.

#### AN APPEAL.

But if what has gone so far has been "writ sarkastik" and in lighter vein, what is to follow is in another key. In all seriousness I put it to somebody in authority—who he is I care not if he can do the thing which is obvious. Cannot a set system of uniform symbols and signs be evolved, for universal use in drawing offices, which shall eliminate this incoherence which is all too apparent and is responsible for countless errors?

Every large old-established firm seems to have its own ideas of what signs and symbols to use, and no two seem to be in accord. This refers not only to tolerance symbols, but to those for portions to be ground, or hardened, or machined and not machined, and in fact sometimes the symbol of one firm for one process may be identical with that of another firm for quite a different one.

#### UNIFORM TOLERANCE.

As to tolerances, cannot we have uniformity here? Surely a choice can be made of the three chief methods in vogue. First, to put simply two dimensions marking high and low limits. Second, to put the nominal size and then attach a plus and minus allowance. And third, to put a nominal dimension with an initial or symbol attached to represent a tolerance to be selected from a set schedule—with the possibility of not happening to have the schedule and having to waste two days writing for it.

Of these three, is not one sufficiently superior to be selected as a universal standard? Even if their respective merits and demerits are about equal, enormous advantage would accrue from selecting one and wiping the other two out.

Some sort of short and concise schedule could certainly be compiled which would cover all needs, and surely, given this, the Air Ministry that is to be, will have sufficient authority to thrust it down the throats of all concerned in the production of aircraft designs.

Verily, I believe the general run of draughtsman and designer would welcome unification of terms. I have discussed the matter with a number and they are agreed that the present state is decidedly not conducive to economy of time and elimination of error.

#### INSISTANCE ON REGULATIONS.

It only wants a guiding hand, someone in authority and who knows his subject, to say that such and such shall be the recognised way of representing so and so, and that this and no other is to be used. Existing prints could be easily altered, where necessary, as occasion arose, and in a comparatively short time the whole scheme should be working freely and easily, to the benefit of all concerned.

And two more points before I quit. Somewhat apart from those preceding, but still relevant to the subject.

#### WHY WASTE TIME AND PAPER?

When I get a blue print and take on the job of making to it, I need about four copies for works, view room, etc. Now the firm who place the order with me could easily supply these without much cost. But to ask them would be something in the way of sacrilege. No! I have to put our tracer on to spend valuable time making a new tracing, with the attendant risk of an error in copying.

And this is the procedure which obtains in hundreds of sub-contracting establishments all over the country. We are at war, short of man-power and almost equally short of paper. The moral is obvious, and is another opportunity for some upper dog to earn his salt.

The second point—also bearing on economy—is this—how many blue prints are made of drawings which are totally unnecessary? Thousands!

All sorts of standardised items, rivets, washers, split-pins, taper-pins, nuts and bolts and screws; all these things could quite easily be drawn in WORDS.

Surely it would be sufficient to call for a  $\frac{1}{4}$ -in. Whitworth, Hex. Mild Steel Nut, 0.52 in. across flats, 0.25 in. thick, and chamfered one side. This describes it fully. WHY DRAW and re-draw IT?

The same thing applies to all the items mentioned and probably many similar, and really the part which would be most amusing, if we were not supposed to be really and truly at war, is that the smaller the item and the plainer, the bigger is the size of blue print—perhaps not in all cases, but in quite a majority, as I can vouch from actual experience.

It is nothing extraordinary to get in a batch of drawings, one crowded and cramped with detail to the point of being dangerously near to unreadable, and another half-a-dozen on the same size paper, where one has to get a magnifying glass to find the object sketched, so small and unassuming is it somewhere near the middle.

The people who make tracing and blue print paper might do a national service here by refusing to make other than a few standard sizes and widths. The proportion of the present expenditure, which could well be done without, must be a quite respectable figure.

Anyway, there's the indictment on its several points, and the suggested remedies. Now it's up to Authority, with a capital A.



# ROLLS-ROYCE

Contractors to H.M. Government.

## Rolls-Royce Aircraft Engines

LIKE

## Rolls-Royce Cars

ARE

## The Best in the World.

### LONDON TO ROME IN 9 HOURS!

*Extract from "THE CAR," October 31st, 1917.*

"Some months ago a Handley-Page Biplane with ROLLS-ROYCE ENGINES carrying two Pilots and four Mechanics with all their luggage and many spare parts flew from London to an Aerodrome near Salonika. . . . No adjustments were made to either Machine or Engines on the way.

"Their actual time in the air was about nine hours as far as Rome, and if the machine had been carrying mails, only the two Pilots would have been needed, and they could have carried a couple of tons of mails."

THE USE OF  
THIS BADGE



is an indication  
that this Firm  
has been accept-  
ed as genuinely  
British by a Tri-  
bunal of Trade  
Competitors

ROLLS-ROYCE, Limited, 14 & 15, Conduit St., London, W.1.

Telegrams: Rolhead Reg., London. <sup>2BYC</sup> AND AT Telephone: 1654 Gerrard (3 lines.)

PARIS. NEW YORK. PETROGRAD. MADRID and BOMBAY.



# AERIAL TRANSPORT AND TRAVEL.

BY LIEUT.-COL. MERVYN O'GORMAN, C.B., D.Sc.

[The following is a verbatim report of a lecture delivered before the Royal Society of Arts by Lt.-Col. Mervyn O'Gorman, C.B., D.Sc., on Nov. 28th. At the time it was, unfortunately, impossible to print a full account of the lecture, owing to pressure on space, but the subject seems appropriate to a New Year issue, and the lecture therefore is reproduced hereafter.—Ed.]

There is talk to-day of aircraft for transport and travel. The carriage of goods, mails, and people, the exploration of remote districts, the conduct of photographic surveys, the searching out of valuable trees in pathless forests, the speedy conveyance of officials to their administrations in distant climes—these things and others are everywhere hopefully dwelt on by the imaginative among those engaged in air work. It would be grossly unjust to say that such hopes and fancies detract from the energies which these persons expend on their war duties; they rather indicate the intention of winning and of carrying on thereafter the life of a virile community.

The public at large, like Gallo, cares for no one of these things, and is a trifle jealous of any thinking which is directed to reconstruction. This attitude, though explained, is not fully warranted by war preoccupations. Once a month, when a bomb or so is aërially transported from Germany to London, we say: "Let us have a new Air Board, Air Council, or Air Ministry," but this can scarcely be described as original or effective thinking. A democracy has got to think, since it has chosen to govern; and when it realises that the mechanism which so easily brings those bombs, in spite of opposition, might very usefully carry a more amiable freight, it will be joining those who see a place for aircraft in our reconstruction. In a paper before the Aeronautical Society, in June this year, I gave reasons to show that in the interest of the war we must care about the future of transport by aircraft. I will recapitulate the position under A, B, and C, for there are three stages in the logic of the matter:—

## THE THREE STAGES.

A. We are to have an Air Ministry and an Air Force; the Act shows that they are not temporary—a token from which alone we may say that we intend to have a fighting Air Fleet.

B. An air fleet differs from a sea fleet in being much more easily expendible. No one would dream of rebuilding the British High Seas Fleet six or eight times per year of war, but an air fleet in action requires, and will continue to require, at least this. Thus the aeroplane has in this context the interesting singularity of being intermediate between a cartridge and a battleship. It is not quite so rapidly expendible as the former, but it is an expendible munition, and when we decide to have an air fleet we also decide, in logic, on the third conclusion, C.

C. This corollary is that we will maintain an aircraft construction organisation in peace that shall be competent to produce some six or eight air fleets per annum in war.

At present we have such an industry—not large enough, perhaps, but we have at least a live and flourishing plant which is bearing fruit, which can grow, and which, be it noted, can also expire. A living organism can be killed by deprivation of oxygen. In three minutes a man is drowned, and 40 years' training of brain and hand can be thus quickly reduced to an inert mass. Similarly rapid is the rate of disintegration of a highly organised technical production department like the Aircraft Industry if it be starved. To-day war orders continue at full flood to fill up the wastage. If they stop suddenly we shall find within three months that the shop organisations are broken up, that all that remains to us is the husk; we shall realise that we could, by timely measures, have saved much of our expensively purchased experience and organisation, and have retained a value far greater than the mere buildings and plant. Once the designers and workmen are scattered, that which is so difficult and expensive to build up will be gone. Our capacity for the production of aircraft will be an object of derision like a bouquet of hairs in an old broom.

This simile will have succeeded if it has led a few score of persons to inquire, "What on earth are we to do to keep this mechanism of production in being without keeping up in peace the war rate of expenditure?" A part of the answer was outlined in my first sentence; we must so utilise aircraft on commercial duty, and so nurse it in its days of trouble, that it shall itself earn the best part of its keep.

If aircraft using can be induced to pay, aircraft making will of itself continue. But, in spite of the firmest belief in the value of aerial travel, the mere institution of services takes time. Neither three months, nor six months, nor a year, will see a thriving mercantile air fleet engaged on its routine duties and issuing its routine orders on which the construction business

depends. Yet a less period of inaction than this will extinguish the industry. This is the period I ventured to call the "hiatus" in the discussion on Mr. Holt Thomas's historic lecture last May. To bridge the hiatus we must do something now. There is no other alternative. No one expects a continued unrequited expenditure of from 25 to 50 million pounds per annum on aerial war material in peace time. On the other hand, no one would object to our making even this large amount of aircraft if it nearly earned its keep by remunerative services in any of the travel and transport businesses, or even, if we could be assured that, after a period of Government support, it would eventually draw near to the standing of a self-supporting industry.

## HISTORIC PRECEDENTS.

If we look back to the birth of the railway and the steamboat we see that for some years they struggled against public apathy—though their potentiality for good and for the creation of wealth and trade was almost as great in Watt's time as now. This apathy, amounting to boycott, rendered them unremunerative for a long period, and deprived the world of travel, and joy and change, and fresh air, and trade progress for well nigh a generation. In the case of the road vehicle, which we now call a motor-car, we had something worse than apathy—we had legislation for the alleged protection of the public, all meant in kindness—which killed the motor-car of 1837 and retarded the car of 1892, till France was well ahead of us. In the case of dynamo electricity we underwent a process of protective legislation against shock and fire possibilities, which threw us well behind Germany and the United States. The story of legal impediments to scientific advance makes one wonder whether we are a free people—that is, with freedom to advance, or are we only set on freedom to stagnate?

The greatest danger that aircraft has to fear, after public apathy, is legislative interference. It is not that the British law, excepting only when it is panicky, is worse made or more malignantly administered than another. The kindly intentions of legislation towards the public are generally as laudable as our laws in technical matters are detrimental. Yet such a community as ours can only live and thrive on its technicians. We are prone to drown the puppy lest he should bite, instead of adopting our own unique maxim of allowing the law to lag, so that the puppy shall have one fair bite before he is muzzled.

## ANTI-PROGRESSIVE LEGISLATION.

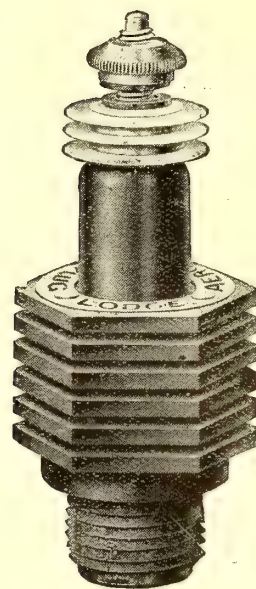
We now know that it was shameful to have waited for the war before building up our Department of Scientific and Industrial Research. No branch of administrative expenditure was known to pre-war politics whose function was to venture forth, or to encourage us by Press publicity, or otherwise to advise the public to risk a little inconvenience during the period of evolution of a difficult art or science. The four-mile, the twelve-mile, and even the twenty-mile per hour motor-car speed limit prove that technical legislation has hampered and did not encourage. Of legislation relating to aerial transport it may safely be said that it is a case requiring the greatest delicacy of handling. It must be taken as certain that Government assistance, I do not say subsidies, for the industry must be forthcoming unless it is doomed, but even if this assistance were certain there remains cause for anxious thought to-day.

The danger of Government support lies in the conditions which a self-protective public is liable to impose before the technical possibilities are sufficiently known to form the basis for any sort of legislative interference. These conditions are liable to be all the more onerous since they could be imposed as of right, and regarded as a *quid pro quo* for the "assistance." The fearful might say that a great unknown risk to those on the ground (*omne ignotum pro magnifico*) is involved in any programme of commercial aeronautics. The braggart has already talked of a sky darkened by aeroplanes, of the cerulean clotted with colliding aircraft, and the timid voter silently wonders how he is to be protected from the debris. Luckily we have the facts with which to dispel this apprehension. To-day we may safely say that £50,000,000 worth of aircraft is yearly poured out from this country's factories. The large majority of this is flown to its destination, or used for tuition and defence at home, yet we still see the sun.

We have a full measure of the nuisance exaggerated by the more hurried training of fliers, and the extreme lightening of structure imposed by war conditions. Such nuisance as there is is purely local, and is really negligible. Now there is no prospect for many a long day of any such £50,000,000 output on commercial aerial transport. It is merely necessary to recall that our total expenditure on merchant shipping is a mere fraction of



# THE RULE OF THE AIR—



## LODGE PLUGS



**THE LODGE SPARKING PLUG CO., LTD.,  
RUGBY.**

*(Complete output of Lodge Aero Plugs reserved for British and Allied Governments.)*



this to see the absurdity of apprehending and legislating as if we were to have this immense user of aircraft. There is no slightest probability of any nuisance in excess of what little we suffer to-day, even if we had, which I see we shall not have, an aerial fleet of this magnitude.

I have indicated the need for restraint in law-making, but there is also need for positive official action, if the bells that ring in peace are not to sound the knell of aerial activity. The Allies must, during the war, frame a joint policy as to the tolerance of each other's trader and postal aircraft, and agree to air routes throughout the parts of the world which they control. With the large expanse of our colonies and our own industrial and postal importance, we have much to offer to the Allies which will be a valued equivalent for that which we shall obtain from them in the way of alighting rights. Being an island, and accepting, as we must accept, the proposition that the most significant section of aerial transport will be outside the confines of Britain, we need that our Allied neighbours shall extend, not only tolerance, but welcome to our machines when engaged on their transport work. We and our colonies should have to be prepared, and, I believe, are prepared, to extend a corresponding welcome to their airmen at home.

#### PREPARING FOR PEACE.

International agreements, even though simple in subject-matter and non-controversial, are always long drawn out. Everyone who understands factory organisation will agree that we cannot afford to wait until after the war for these parleyings to begin. Our aeronautical organism will assuredly become disintegrated too quickly. If we can get four or five willing men round a table to agree to admit aircraft mutually, to register them, to agree to simple preliminary rules of the road, and to agree that their respective countries should initiate a few lines of landing-grounds so as to constitute safe routes, the early days of trade flying have little more to ask for from the foreign offices of the world.

No doubt in some four or five years of active aerial transport organisation work the paltry fifty or hundred aeroplanes of our early post-war efforts at transport and travel will have grown up into a significant carrying trade for high-speed work, large quantities of aircraft will have been used for commercial purposes, and it will be found useful to introduce, and there will be experience enabling us effectively to introduce, valuable regulations for the protection of passengers in aircraft, and the public on the ground beneath. At the present day it is clear to all who have eyes to see that no adequate knowledge exists on which to frame rules with discrimination and without grievously hampering technical development.

#### THE DANGER OF SAFETY.

I can imagine a legislature winning a round of applause from the *inane vulgus* by driving a hard bargain with the wretched trader, who, in the face of starvation, might accept any regulations, however hampering, in exchange for the means to live. I can imagine the imposition of tests of airworthiness, strength tests, the enforcement of hobbies such as multiple engines, silencers, special alighting gears, the carrying of parachutes, fire extinguishers, wireless equipment for calling for aid, and countless other things, which may, no doubt, come in their own time, but which would clog the versatility of the engineer, and for years condemn to unproductiveness the nascent industry of air travel. The payment of an army of inspectors would be put down as encouragement money, and would be a charge against the aeronautical vote. A landowner would ask for the power to capture the flier who has most reluctantly alighted on his ground. He might ask for a law allowing him to impound the aeroplane, on the chance of his registered number being inauthentic, and so secure payment of the damages which he wishes to claim.

It is just possible that regulations of this sort might meet with support, as much as support is at present accorded to the 20-mile speed limit of the motor-car. They would be next to impossible to remove, though they might be demonstrably hampering the aircraft development of the country to an enormous extent. The intentions would be good, the desire would be to secure that only the best aircraft were used, and that the public suffered no injury by its use. It was for half a century thought that the public could suffer no injury by the four-mile speed limit imposed on mechanical traction! Later it was thought that as a 12-mile an hour speed limit was ample for a coach-and-four, it must be an ample speed for a car, and so the automobile industry passed to France and Germany, in spite of the fact that the first car plied for hire in England early in the reign of Queen Victoria, when there was no speed limit.

#### A SAFE PROPHECY.

Let us rest assured that the amount of civil aircraft will for some years be so much less than the amount of military aircraft now existing, that the total of damage to property and inconvenience to the public, which we at present know to be small, will be much further reduced in proportion to the lesser

numbers, the future technical advances, and the less strenuous conditions of manœuvring imposed on peace aeroplanes.

#### LABOUR.

**Labour.**—Among the expectations based on aerial transport and travel are those of employment for individuals throughout the whole social scale as well as officers and men from the Army and Navy. Our producers, and therefore their employment of labour, depend on the bodies which employ aircraft—viz.: (a) Primarily the Air Force; (b) foreign buyers, nations and colonies; and (c) companies instituted for transport and travel, including postal duties. All these bodies need labour, and all are interested in continuing harmonious relations between those who direct the work and those who manually carry it out.

#### PLUS ÇA CHANGE, PLUS ÇA RESTE.

It has been suggested that since the aircraft industry is a new industry, an exceptional opportunity exists of introducing a totally new atmosphere of harmony unembittered by the old trade quarrels. This is most desirable, but the novelty of the technics of aircraft has not in fact eliminated the old trades at all; on the contrary, it has developed the demand for these "tradesmen." The Aircraft Industry is not a new trade in the sense in which that word is used by the world of labour in the phrase "Trades Union." The Aircraft Industry includes members of almost all the engineering trades, as well as important additional trades, such as woodworkers, carpenters, organ builders, cabinet makers, fabric workers, etc., and it is necessary for that harmonious relationship to be established between employer and employee, in spite of the fact that the history of all the old trade differences will unavoidably be also the history of the persons and corporate bodies imported into the new industry, with this addition, that a trade quarrel on the subject of organ pipes or on the piece-work price of chairs, may mean a stoppage of aeroplane work, owing to the newly imported craftsmen holding on to the old unions.

Again, it would be unintelligent to pretend that aircraft making can be developed under a compact between employees and managers which shall guarantee continuity of employment for all the manual workers in exchange for a continuity of labour supply to the other. The difficulty is a fundamental one, and perhaps is a worse difficulty in the Aircraft Industry than in most others. It is this. The technical developments of the art, the unforeseeable shortages of material, and the unavoidable changes of method and of materials, tend, let us say, at one time to the employment in an aircraft factory of 50 per cent. of wood workers and 30 per cent. of steel workers, and there is no human authority who can with sanity pretend to say that in some brief time these proportions will, or will not, be widely changed. If steel or aluminium were to form a greater part of the structure than they do now, because of safety, or diminished fire risk, or what not, any agreement with the wood workers' union for continuity of their employment would install them as a paid but non-working body of pensioners on the industry. Alternatively, British aircraft, hampered by such an agreement, would remain locked in its old technical groove and be debarred from adopting the devices and inventions which throughout the rest of the world would be improving the machine. Surely a hopeless prospect for a technical service required for war!

It is clear, then, that the agreements between manual and brain workers on aircraft must be part of the general agreement on which our new millennium is to be based.

#### TO SAVE DISAPPOINTMENT.

**Employment of Soldiers and Sailors.**—The industry will, even when the most strenuous efforts have been made to save it by such continuance of air service orders as are at all possible, and when such aerial transport work is started as may be decided on, still be cut down drastically. Hence very great disappointment will be spared to many a good man by realising thus early that there will be no expansion of employment on aircraft which will absorb them wholesale, but rather a manifold shrinkage.

#### PUBLIC CONTACT.

**Accidents.**—It is unfortunate that the chief contact which the public of England makes with aeronautics is in relation to accidents and casualties. The achievements appear, it is true, but it is almost impossible to visualise them save perhaps in the case of an occasional flight of unusual distance, such as the recent 3,000-mile flight from London to Constantinople, or between London and Turin, and these things appear to be disconnected items giving no impression of the hundreds and thousands of miles of continual flying which is taking place. These show flights are few, not because they cannot be frequently achieved, but because war does not provide for show and *réclame*. The public cannot by mere lecture be brought to the point of view which is standard with those who have been fully familiar with aircraft; we are so imbued with its utility and versatility, that we are no more discountenanced by occasional breakages than we are deflected from hiring a taxi by seeing a sideslip against the kerb. Those actually engaged in design, who naturally need to use every element of experience which acci-



# **SUNBEAM-COATALEN AIRCRAFT MOTORS**

---

---

**CONTRACTORS TO H.M.  
ADMIRALTY, RUSSIAN &  
FRENCH GOVERNMENTS**

---

---

**The SUNBEAM MOTOR CAR CO. Ltd.**  
Head Office and Works - - - WOLVERHAMPTON



dents may bring to enable them to perfect their work, are anxious to study and analyse these occurrences.

#### REASONS FOR ACCIDENTS.

Air accidents can be divided into groups for the purpose of their study, and when we proceed so to divide them we find that by far the largest category includes those which are due to the two following circumstances: (1) The absence of landing-grounds distributed in easy stages to which a flier can turn for refuge if his engine should stop; (2) the inexperience of fliers themselves, since the majority of the experienced have been drawn off to the war. If we remove from the records of accidents, other than tuitional, all those which could have been avoided were these causes non-existent, the residue would be less significant in fact, and vastly less significant than is the impression abroad. Beyond this it is still reasonable and advantageous to sub-divide the causes of this residue of accidents into classes, so that attention should be drawn to that which may be eliminated, be it in design or in handling.

Of the remainder, the most important is what is commonly called "Pilot's error." This does not imply that he is blame-worthy. In war, manoeuvres which are definitely hazardous are necessary; people may be surprised to hear that to loop the loop is a useful war manoeuvre which may greatly puzzle an antagonist in the air, since the looped path takes the place of the expected forward movement, and therefore falsifies the aim of the adversary, or throws out all his estimate of the direction in which to fly for purpose of intercepting him. Another manoeuvre, known as "spiralling," or "spinning," if contrived to give the impression that the aeroplane has in fact been thrown out of control, is one of many ruses for breaking off a fight. The learning of these manoeuvres must be achieved before they can be used in war, and tends to swell the number of broken machines. Rapid diving, such as might be made in an attack on observation balloons, may similarly be a cause of accident until judgment is acquired in the method of "flattening" out of the dive. Even to describe a very small circle in a horizontal plane implies unusual stress on an aeroplane, if accomplished at high speed. None of these manoeuvres are called for in trader work, while, to add to the comparative safety of the peace aircraft, we can appreciate the effect of removing the war demand for high performance and speed. Under fire and pursuit safety comes from lightness and manoeuvrability, as much as, or more than, it does from strength and solidity: in trader work the conditions are largely changed if not reversed.

#### REDUCED RISKS.

Aircraft travel and transport therefore will, if landing-grounds are provided, not be exposed to any of the risks above named, and accordingly from the list of accidents which occur to-day we must eliminate almost all these in any prognostication as to the future safety of flying. Before such an audience I need not belabour the so-called *air pocket*. It never did exist, and generally there seems to be little probability of any aeroplane, even when designed on the factor of strength used to-day, with the limited science of to-day, being broken in the air under the conditions of aerial travel.

Much need not be made of the fire dangers on aircraft, for when the matter is regarded dispassionately, the fire risk by actual experience is small. Of the fires which have occurred since thousands of aeroplanes have been turned out per month, the large majority have arisen when the aeroplane has struck the ground and the petrol vapour from the broken up tanks has come into contact with a spark. Now this breaking-up of a machine on the occasion of a forced landing again becomes a rare occurrence if the line of landing-grounds suggested for aerial routes is provided. Most of these smashes, some fraction of which have resulted in fires, have occurred by reason of the flier holding up his machine unduly long in his search for a suitable place to alight in a country where no provision for alighting exists.

#### INCREASING SAFETY.

Of the mechanical precautions taken to avoid fire, we know that already it has been possible to make a magneto which, when filled with explosive vapour and surrounded by it, gives rise to no ignition of the mixture. We have also learnt that the back-firing or "popping" of an engine into the induction pipe, which throws a flame back, can be made innocuous by drawing the air supply of the engine from outside the body work. This, indeed, is standard practice to-day. The use of electrically heated clothes, called for by fighting at heights such as 20,000 ft., will not be normally desirable, and as for appliances for wireless telegraphy, which will have their place for giving trader craft their direction and for calling to the ground, they will not under peace conditions impose any risk of fire which cannot be circumvented. In general the standard of safety from this point of view will be automatically enhanced in all transport work. Carelessness, such as makes people bring matches into a T.N.T. factory, cannot be expunged from the human race, but this

class of occurrence need not disconcert us at all. In filling up with petrol there is the chance of spillages, and no doubt but that every aerodrome should be equipped with portable fire-extinguishers of light weight made available at filling points, and no doubt also but that all larger aeroplanes will carry one in an accessible position, until the proved absence of utility causes them to be relinquished.

#### FOG DANGERS.

The accident, if it can be so called, of losing one's way in a fog will be far less likely to result in disaster, when, to quote it once more, there exists a multiplicity of landing-grounds, because, on the one hand, no fog has been found to extend more than a very limited height, say, 700 yards maximum, and, on the other hand, because we now know that fogs are quite local in their occurrence at any one moment. A befogged flier, instead of alighting through a foggy patch, merely moves a little farther on before landing. This does not imply that projects for signifying to a flier who is above the fog the correct position of his aerodrome by pilot balloon or raised lights are to be discarded, but this is not the place to deal with that point.

#### PARACHUTES.

Parachutes are spoken of, but by many fliers are not thought particularly desirable. We know that at present they require a height of some 500 feet to open out and afford the safety which they appear to offer, and it is usually below these levels that the flier becomes convinced he is to be exposed to some risks, say, by the conditions of the ground together with the stopping of his engine which causes him to alight. One would have to be very seriously out of touch with those who fly daily and really know their job, if one continued in the impression that numbers of accidents are the inevitable concomitant of aerial travel, and it is sufficient to say that any such opinion may be dismissed as one which has arisen from the peculiar conditions of Press publicity in war and the exclusively high pressure and high performance conditions of the development of aeronautics up to to-day. The lack of contact of the public with the serious and successful work which has been achieved has already been mentioned.

#### WIND TUNNELS.

*Research.*—It is possible that someone will question the need for research and for State endowment thereof; it may be said that we are well on and can now trust to practical developments, since root and branch retrenchment of expense is called for. This is a complete *non sequitur*. If cheap progress is wanted, the cost of progress is enormously reduced by making and testing models two feet wide instead of making structures of a 100-ft. span. The ratio of cost is as £10,000 to £50, and it is the £50 scheme which I am advocating. I cannot give a list of researches, but ask you to consider the following examples. We need the scale corrections from model parts to full size; we need to test propulsive mechanisms, without building them; we must know the value of new wing sections; of reflexed wings; of hinging the flaps for controls; we must, in order to get any aeroplane stable, know the movement of the centre of pressure on the wings when the attitude of flight is varied; we must study the effect of vibration on structural parts, etc.

We are aware that the great utility of aerial travel is speed, that the great enemy of speed is head resistance, and we must be able by simple model tests to forecast the speed which will be attained by a given design. We must be able to know, before we introduce a variation in design, the amount of economy of resistance which can be made by altering structural parts. All this class of work can be effected in the wind tunnel, and already most serious aeronautical construction firms are equipping themselves with a wind tunnel. Probably the greatest value of such equipment is its educational effect. The wind tunnel has fought its way to the front, in spite of much opposition, and it is still to be recognised that unless its indications are interpreted by skilled persons grave blunders will be made, but this in no wise detracts from its utility when properly employed.

#### ENGINES, AIR SCREENS, AND OTHER THINGS.

We are aware that the thermal efficiency of engines employed on aircraft is as high, in spite of their small size and weight, as the efficiency of Diesel engines giving thousands of horse-power. Yet this figure is only 30 per cent., and by research alone can we hope to obtain an extension of this percentage. The study of airscrew efficiency, the effect upon it of the body, the means for making airscrews smaller than they are at present, and thereby simplifying the whole outline of an aeroplane, is a matter which research must tackle. The use of new alloys, of new methods of totally enclosing the flier in an aeroplane, new methods of housing the landing gear, so as to get rid of its head resistance, the protection of the fabric of the wings from disintegration by ozonisation due to actinic light, all these and countless more matters can only be economically and expeditiously studied in laboratories equipped for the purpose, they will effect enormous economies in aeronautical upkeep, and aero research must be pressed on and financed after the war.

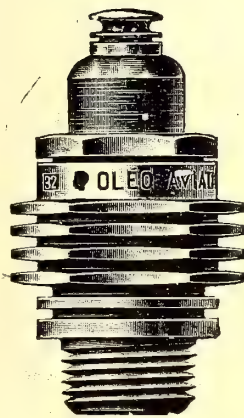
Broadly, it may be said that air transport will not develop save

(Continued on page 79).



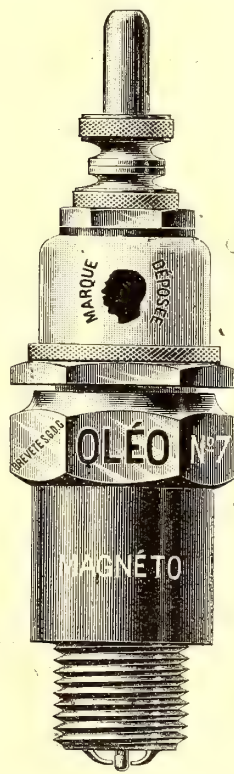
# Ripault's OLEO PLUGS

ARE SUPPLIED TO  
THE AIR MINISTRY  
MANY THOUSANDS  
:: EVERY WEEK. ::



No. 32.

THE FIRST  
AERO PLUG  
USED BY THE  
BRITISH GOVERNMENT



No. 7.



No. 27G.

THE FIRST  
AERO PLUG  
TO GAIN FAME

LEO. RIPAULT & Co., 64a, Poland Street, London, W.1.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# HANDLEY PAGE

## AEROPLANES.

.....

**1912**

In July, 1912, the first flight across London was made in a Handley Page Monoplane.

**1915**

In July, 1915, a Handley Page Biplane carried 21 persons to a height of 7,180 feet—a world's record for the greatest number of people ever carried in one machine.

**1917**

In July, 1917, a Handley Page Biplane fitted with two 275 h.p. Rolls-Royce Engines flew from London to Constantinople—"a total distance of nearly 2,000 miles . . . in 31 hours . . . easily a world's record for a cross country journey and also for the weight carried for the distance."—*Admiralty Official Communique.*

**Handley Page, Ltd.,****CRICKLEWOOD,****LONDON, N.W.**

Telegrams:—"Hydrophid, Crickle, London."

Telephone:—Hampstead 7500 (6 lines.)



**Contractors to the Admiralty and Air Board.**

**THE  
CENTRAL AIRCRAFT  
COMPANY.**

**DESIGNERS AND CONSTRUCTORS  
OF AIRCRAFT.**

***Office and Works :***

Telegrams : AVIDUCTION, PHONE, LONDON.  
Telephone : HAMPSTEAD 4403, 4404.

**KILBURN, N.W.6.**



# MANNECERTON & Co.Ltd.

CONTRACTORS TO THE ADMIRALTY  
AND H.M. WAR OFFICE.

## Designers and Manufacturers of Proved Efficiency of all Types of AIRCRAFT

HEAD OFFICE AND WORKS

### **AIRCRAFT WORKS, NORWICH**

---

#### SPECIAL DEPARTMENT

for the manufacture of

#### AIRCRAFT ACCESSORIES

(Strainers, Bolts and Nuts, etc., etc.)

177, CLEVELAND ST., LONDON, W.1.

# MANNECERTON & Co.Ltd.

LONDON

NORWICH

IPSWICH

BURY ST. EDMUNDS.



**WOODSIDE ENGINEERING COMPANY, LTD.,  
POSSILPARK, GLASGOW.**

# **AEROPLANE TIERODS**

: IN :

**STREAMLINE AND ROUND SECTIONS**

COMPLETE WITH

**UNIVERSAL OR FORK JOINTS**

**LARGE STOCKS.**

---

**PROMPT DELIVERY.**

---

**Telephones.**

**WORKS: 1495 Douglas (2 lines.)**

**OFFICE: 3456 Central (3 lines.)**

(Private Branch Exchange.)

**Telegrams: "FUSELAGE," GLASGOW.**

**Registered Office**


**50 WELLINGTON STREET,  
GLASGOW.**

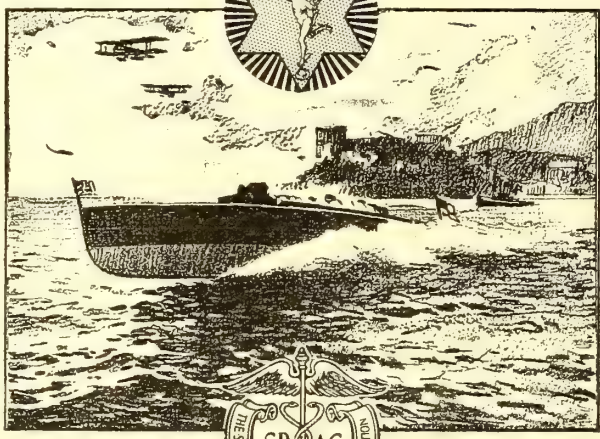



# S. E. SAUNDERS

LIMITED  
ESTD 1830

## DESIGNERS & CONSTRUCTORS OF AIR AND MARINE CRAFT







*Head Office and Productive Works*

## EAST COWES. I.W.

*Erecting & Testing*

*Solent Yard, Cowes & Osborne Works, E. Cowes*

SEAPLANES

*West Medina Aerodrome*

*East Cowes*

LAND MACHINES

*Telegrams "CONSUETA EAST COWES"*

*Phone COWES 193 (4 Lines)*

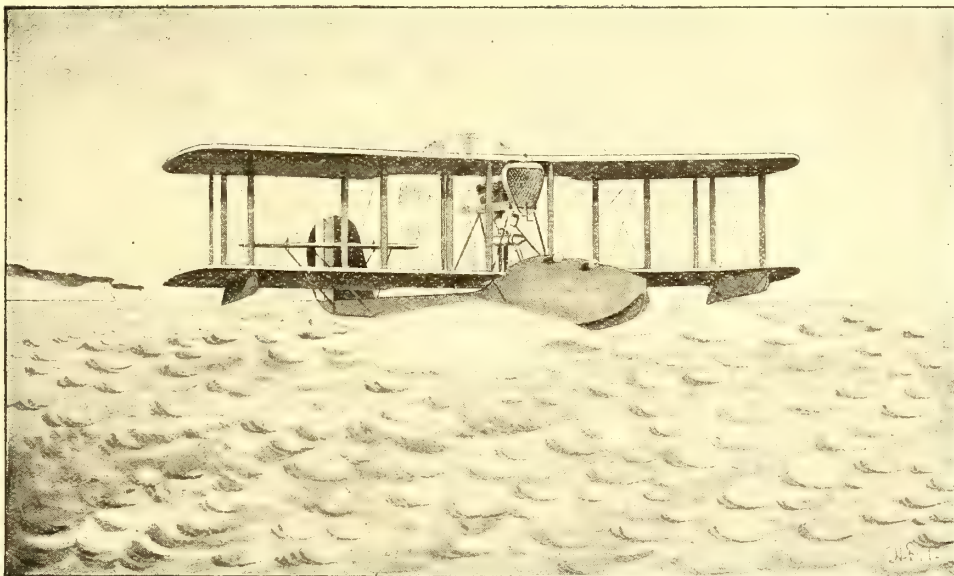


*A PRE-WAR FIRM.*

# THE NORMAN-THOMPSON FLIGHT CO., LTD

*DESIGNERS & CONSTRUCTORS OF FLYING BOATS.*

**ESTABLISHED 1909.**



"Getting under way."

.....

**"THE FIRM WHO GAVE THE FLYING BOAT TO THE NAVY."**

Works :

MIDDLETON  
BOGNOR.

Bognor 48.

London Office :

DEWAR HOUSE,  
HAYMARKET, S.W.1.

Gerrard 7385.



**“ “ CONTRACTORS TO “ “  
HIS MAJESTY’S WAR OFFICE**

*Messrs. Gordon Watney & Co. Ltd*

**AERONAUTICAL AND  
GENERAL ENGINEERS**

**South Lodge Motor Factory**

**WEYBRIDGE**



**Telephones WEYBRIDGE 550 (7 lines),      Telegrams: "MERCEDES, WEYBRIDGE."**



CONTRACTORS TO THE ADMIRALTY AND AIR BOARD.

# C. G. SPENCER & SONS, Ltd

AERONAUTICAL ENGINEERS.

MAKERS OF

KITE BALLOONS,

PARACHUTES,

AIRSHIPS, and

Balloons of every description.

FABRIC,

ROPES,

KITE CORDS,

VALVES,

BASKETS,

And Aeronautical Apparatus of every description.

*FIRST IN 1835.*

*FOREMOST TO-DAY.*

*Works :*

Highbury, Clapton, Hackney and Brixton.  
**LONDON.**

*Head Office :*

**56a, Highbury Grove, LONDON, N.5.**

Telegrams : "AERONAUT, LONDON."

Telephone : DALSTON 1893.



# ACCLES & POLLOCK, LIMITED.

**THE  
FIRM WITH  
THE LONGEST  
AIRCRAFT EXPERIENCE**

We were "at it" long before the War; paid a heavy price for our experience, but were there when the need arose.

**FOR STEEL TUBING**

in Nickel Steel, Chrome Nickel Steel, or Carbon Steel, any Section or Gauge, plain or manipulated, or for Sheet Steel Presswork, we know the requirements, and have the skilled labour and machinery to manufacture the completely satisfactory article.

**AMONG THE MANY AIRCRAFT PARTS WE MAKE ARE**

RUDDER FRAMES.	RIBS & FINS.
EXHAUST PIPES.	FERRULES.
ELEVATOR FRAMES.	LEVERS.
GUN MOUNTINGS.	CLIPS.

**OUR LIST**

is in course of production. May we add your name to those desiring a copy when completed?

In the meantime, let us send you our lists of "Apollo" Tubular Spanners, the Tools *par excellence* for quick and certain service, and also particulars of "Apollo"

Mykarms for temporarily turning any Micrometer into a high and low limit Gauge.



# ACCLES & POLLOCK, LIMITED.

**OLDBURY**

TELEGRAMS: "ACCLES, OLDBURY."  
TELEPHONE: OLDBURY 111 (4 lines).

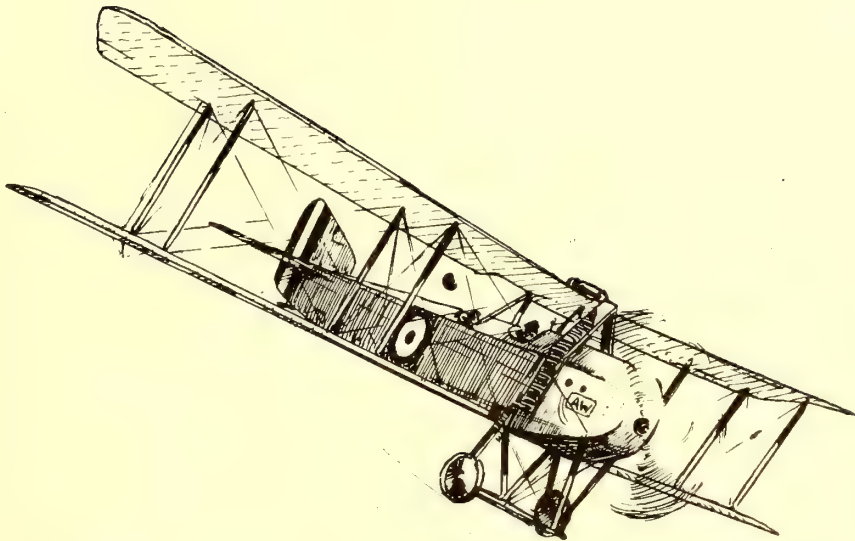
**BIRMINGHAM.**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



SIR W.G. ARMSTRONG  
WHITWORTH & CO. LTD.

CONTRACTORS TO H.M. ADMIRALTY AND  
WAR OFFICE



AIRCRAFT-WORKS  
NEWCASTLE - ON - TYNE

TELEGRAMS  
ARMSTRONG AVIATION  
NEWCASTLE - ON - TYNE

TELEPHONE  
500. GOSFORTH



HJALMAR  
ROSENVINGE

# **WILLIAM BEARDMORE & CO. LTD.**

**Aviation Department**

**Dalmuir, near Glasgow**

## **AIRCRAFT MANUFACTURERS**

**Telephone . . . 240 Clydebank**

**Telegrams . . Beardmore, Dalmuir**





**CELLON**  
- NON-POISONOUS -  
**DOPE**

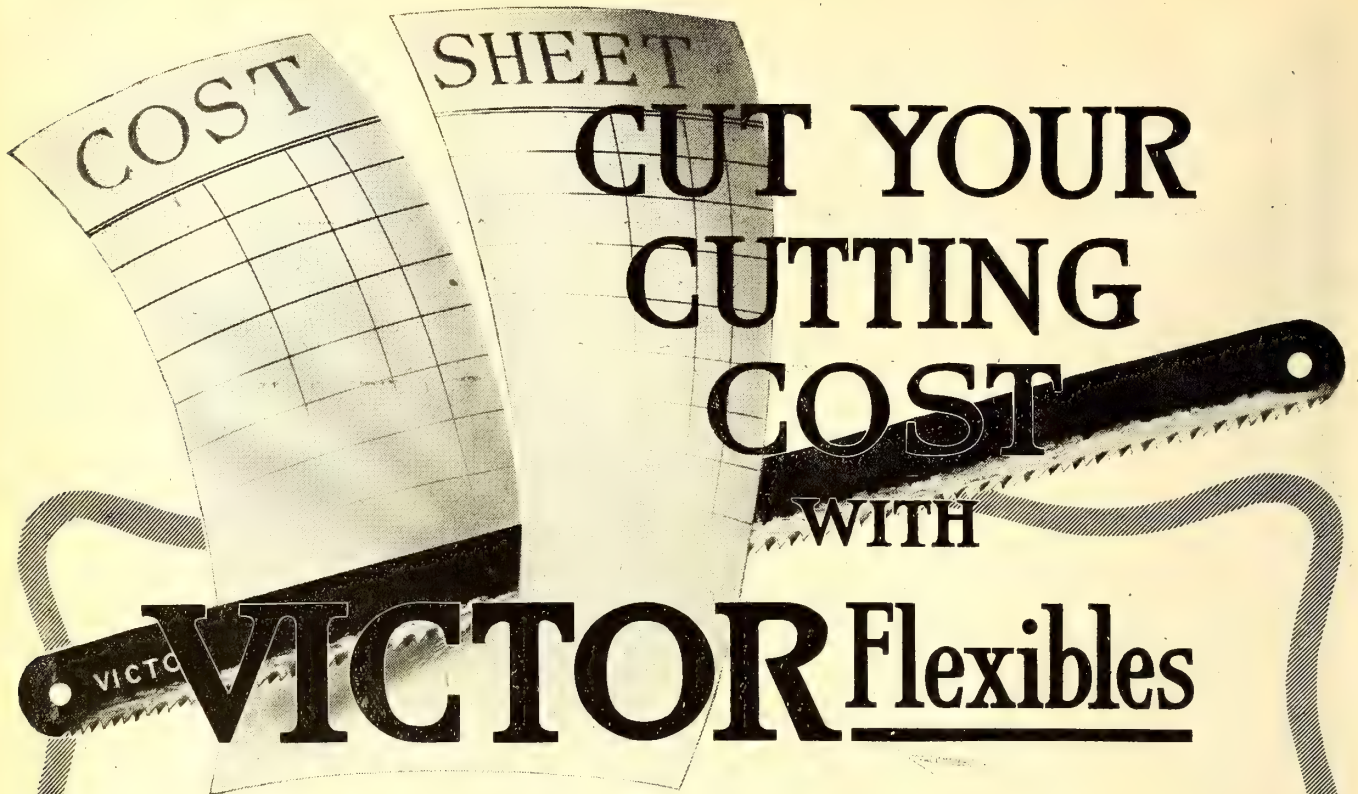
**CELLON, LTD.,**  
Broad Street House, E.C. 2.  
Telephones: London Wall 5359, 5622.  
Telegrams: "AJAWS London."

CELLON WORKS

GEOFFREY WATSON 1917

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





The high cost of tools should emphasize more than ever the importance of quality.

The high cost of hack saw blades ought to drive every hand blade user over to the saw that does not break in ordinary hand work.

VICTOR FLEXIBLE HACK SAW BLADES have exactly the same cutting power as the finest All-Hard on the market, and that they cannot be broken in use except by intentional abuse is an undisputable fact—which will represent a saving from twenty-five percent to thirty-three and one-third percent in breakage alone.

Seventy-five percent of the All-Hard blades used in hand frames break before they are worn out. Watch the All-Hard blades in your own shop and see the enormous amount of breakage—then use VICTOR FLEXIBLES and note the economy.

**VICTOR SAW WORKS, Limited**  
2-3 West St., Finsbury Circus, London, E.C.





**NON-POISONOUS  
DOPE**

**TITANINE**



THE  
**BRITISH AEROPLANE  
VARNISH CO., LTD.**  
166, PICCADILLY, LONDON, W.1

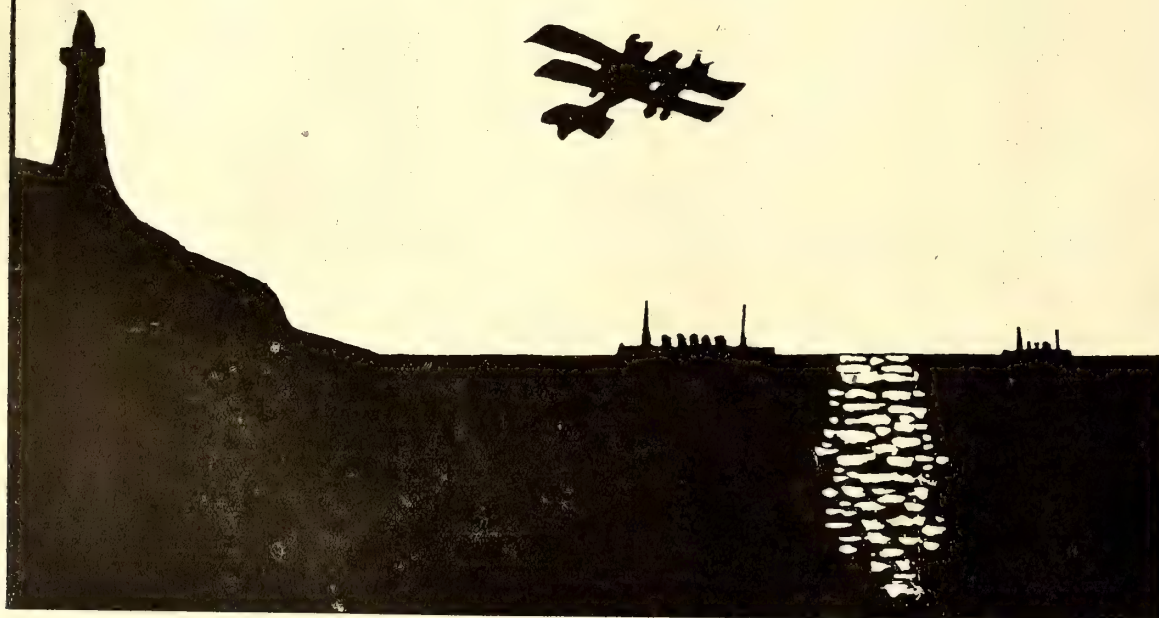
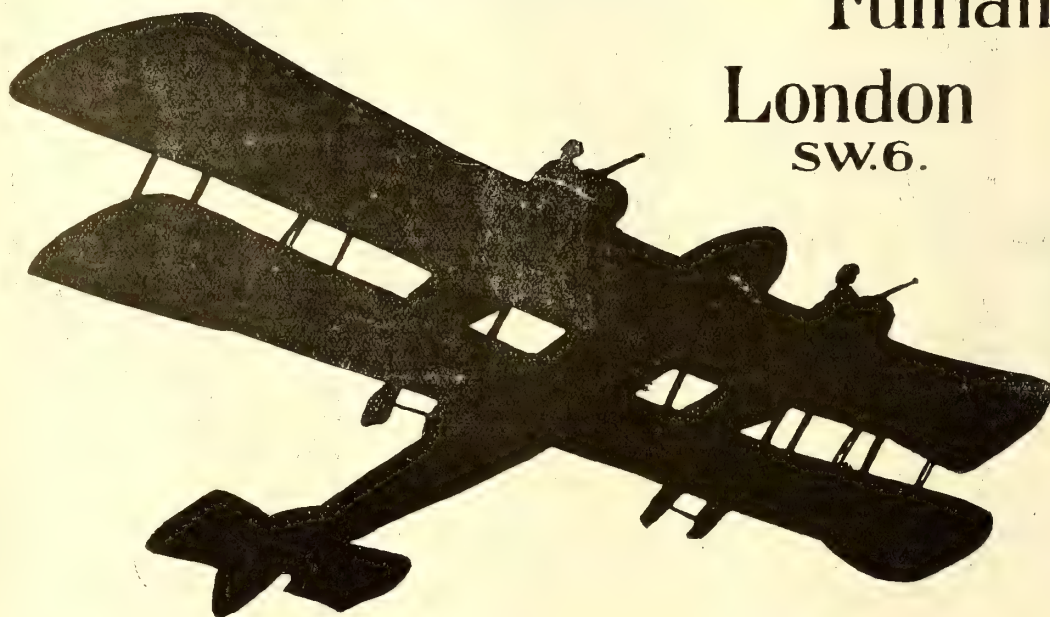
Telephone : . . . . . GERRARD 2312.  
Telegrams : TETRAFREE, PICOY, LONDON.

# THE REGENT

CARRIAGE CO. LTD

Fulham

London  
SW.6.



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





is assured if you  
use Naylor's  
Superfine Products.

Write for Booklet describing  
Specialities for AERO WORK.

Our qualities include :

### AIRSCREW VARNISHES

(Particulars of scheme approved by A.I.D., free on request.)

Dope-resisting White Paints  
and Varnishes,

Seaplane Varnishes, Etc., Etc.

And a variety of other approved Finishes.

Samples sent with pleasure.

### NAYLOR BROTHERS

(LONDON) LTD.

Manufacturers of Superfine Varnishes,  
Paints, Enamels and Distempers,

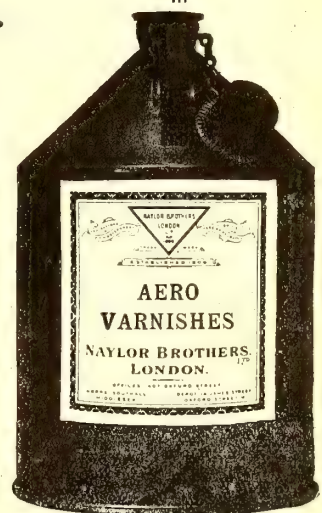
**LONDON & SOUTHALL.**

Offices : 407 & 409, OXFORD ST., London, W.

Depot : 14, JAMES STREET, Oxford St., W.

Established 117 Years.

Contractors to all Government Departments.



## Acceptance and Experimental Flights—

The Procter Isaac Aviation Co., "Alromnia, Piccy, London." Gerrard 278 (2 lines).

## Acetylene Welding Plant—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.  
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." 3540 Victoria (3 lines).

## Aeroplane Manufacturers—

Aircraft Manufacturing Co., Ltd., Hendon. "Airmanship, Hyde, London." Kingsbury 180.

Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle-on-Tyne. "Armstrong Aviation, Newcastle-on-Tyne." Gosforth 500.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

British & Colonial Aeroplane Co., Ltd. (The Bristol Co.), Filton, Bristol. "Aviation, Bristol." Bristol 3906.

British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudron, Cricklewood, London." Hampstead 5551.

Central Aircraft Co., Palmerston Works, High Road, Kilburn, N.W.6. "Aviduction, Phone, London." Hampstead 4403 and 4404.

Davidson Aviation Co., Ltd., Hammersmith, W.6. "Hammersmith 1144-1145.

Eastbourne Aviation Co., Ltd., Eastbourne. "Aircraft, Eastbourne." Eastbourne 1176.

Graham-White Aviation Co., Ltd., London Aerodrome, Hendon. "Volplane, Hyde, London." Kingsbury 120.

Handley Page, Ltd., 110, Cricklewood Lane, N.W.2. "Hydrophid, Cricklewood, London." Hampstead 7420.

Mann, Egerton & Co., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Martinsyde, Ltd., Brooklands, Byfleet. "Martinsyde, Weybridge." Woking 331; Byfleet 171.

National Aircraft Co., Ltd., 15, Hackney Road, N.E.2. "London Wall 6725.

"Nieuport" & General Aircraft Co., Cricklewood, London, N.W.2. "Nieuport, Cricklewood, London." Willesden 2455.

Norman-Thompson Flight Co., Ltd., Bognor. "Soaring, Bognor." Bognor 48.

The Regent Carriage Co., Ltd., 126/132, New King's Road, Fulham, S.W.6. "Carbodis, London." Putney 2240-2241.

Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester." City 8530-8531, Manchester.

Saunders, S. E., Ltd., East Cowes, I.O.W. "Consuta, East Cowes." Cowes 193.

Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tested, Phone, London." Regent 378.

Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston." Kingston 744.

Standard Aircraft Manufacturing Co., Effingham House, Arundel Street, W.C.2. "Gunsignrush, Estrand, London." City 59.

Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickerlyta, Knights, London." Kensington 6810.

Waring & Gillow, Ltd., Hammersmith. "Warisen, Ox, London." Museum 5000.

Westland Aircraft Works, Yeovil. "Aircraft, Yeovil." Yeovil 129.

White, J. Samuel, & Co., Ltd., East Cowes. "White, East Cowes." Cowes 3.

Whitehead Aircraft (1917), Ltd., Richmond Surrey. "Whitecraft, Richmond, Surrey." Richmond 1865.

## Airships—

Airships, Ltd., High Street, Merton. Wimbledon 1314.

Short Bros., Rochester, Eastchurch, and Whitehall House, S.W. "Tested, 'Phone, London." Regent 378.

## Aluminium Castings (Sand & Die)

Coan, R. W., 219, Goswell Road, London, E.C.1. "Krankases, Isling, London." City 2846.

## Bearings (Etonia Cast Phosphor Bronze)—

Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds." Central 3027.

## Brass Sheets for Tipping Propellers—

Pritt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fep, London." Avenue 995, 996, and 7006.

## Buildings—

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

Palmer, T. W., & Co., Church Road, Merton Abbey, Surrey. "Wimbledon 1313.

Rubery Owen & Co., Darlaston, South Staffs. The Willey Co., Ltd., Salisbury House, London Wall, E.C.2. "Wrathless, Phone, London." City 2681-2.

## Cable Coverings and Cable Controls—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Capstan Work—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Carburettors—

Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.1. Victoria 4670.

## Casein—

Nieuwhof, Surie & Co., Ltd., 5, Lloyds Avenue London, E.C.3. "Suric, don, Fen, London." Avenue 34 & 35.

## Castings—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Castings (Aluminium, Brass, Bronze, Machined or Rough)—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Celluloid (Non-Flam.)—

Greenhill & Sons, 8, Water Lane, E.C. "Greenberg, London." Central 1306-7.

London Label Co., Beckton Road, E.16. "London Label, Canning, London." East 1300.

## Clothing—

Burberry's, Ltd., Haymarket, S.W.1. Regent 2165.

Dunhill's Ltd., Euston Road, N.W.1. "Dunhill, London." North 3405-6.

## Component Parts—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines).

B. D. V. Aircraft Spares, Syon Chambers, 16a, New Road, Richmond, Surrey. "Aeros, Richmond." Richmond 1681.

Central Aircraft Co., Palmerston Works, High Rd., Kilburn, N.W.6. Hampstead, 4728.

"Aviduction, Phone, London." Central 733 (3 lines).

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

The Aircraft Construction Co., Harley Works, Beckton Road, E.16. "Aeracracons, Canning, London." East 1300.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

## Cords, Tapes, and Threads—

MacLennan, J., & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.

## Dopes—

British Aeroplane Varnish Co., Ltd., 166, Piccadilly, W.1. "Tetrafree, Piccy, London." Gerrard, 2312.

British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellulite, London." Regent 4046.

The British Emailite Co., Ltd., 30, Regent Street, S.W.1. "Ridleyren, Piccy, London." Gerrard 280.

Cellon, Ltd., Broad Street House, New Broad Street, E.C.2. "Ajawb, London." London Wall 5350-3622.

Clark, Robert, Ingham & Co., Ltd., Walter House, Bedford Street, Strand, W.C. "Pearline, Westrand." Regent 3923.

## Electrical Accessories—

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207, London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Eus-road, London." Museum 70.

Premier Electric Heaters, Ltd., 258, 259, and 360, Bradford Street, Birmingham. "Fahrenheit, Birmingham." Midland 681.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

## Electric Cables—

E. Kalker & Co., Coventry. "Kalker, Coventry." Coventry 248.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207, London Wall 1564.

## Electric Lighting and Power—

E Stanley Fardon, A.M.I.E.E., 67, Mosley Street, Manchester.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207, London Wall 1564.

## Engines and Parts—

Allen, W. H., Son & Co., Ltd., Queen's Engineering Works, Bedford. "Pump, Bedford." Bedford No. 1.

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

The Beatty School of Flying, Ltd., The Broadway, Cricklewood, N.W.2. Hampstead 3000.

Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London." Gerrard 238.

Dudbridge Iron Works, Ltd. (Salmonson), 87, Victoria Street, London S.W.1. "Aero-flight, Vic, London." Vic 7026.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

Gordon Watney & Co., Ltd., Weybridge. "Mercedés, Weybridge." Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham. Richmond 1203.

Gwynnes, Ltd., Hammersmith Iron Works, Hammersmith, W. "Gwynne, Hammersmith." Hammersmith 1010.

Napier & Son, D., Ltd., 14, New Burlington St, London, W., and at Acton, W. "Nitriker, London." Gerrard 8926.

Robertson, J. H., & Co., 1, Albemarle Street, London, W.1. Regent 3906.

# THE AEROPLANE

## Engines and Parts (continued)—

Rolls-Royce, Ltd., 14 and 15, Conduit St., W.1. "Rollhead, London." Gerrard 1654-5-6.

The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. Regent 1181.

Sturtevant, B. F., Co., Ltd., Hyde Park, Boston, U.S.A.

Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorfield, Wolverhampton." Wolverhampton 985.

The Gnome & Le Rhône Engine Co., Ltd., 47, Victoria Street, S.W. "Elevenfold, London." Walthamstow 408 (2 lines).

## Flare Lights—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." 3540 Victoria (3 lines).

## Flexible Shafts—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Flying Schools—

Bournemouth Aviation Co., Ltd., Talbot Village, Bournemouth. "Etches, Winton." Bournemouth 1160.

## Furniture (Office)—

Cooke's (Finsbury), Ltd., Finsbury Pavement House, London, E.C.2. London Wall 573 and 6179.

## Galvanising—

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

The Rustless Iron (Cowper Coles Process) Ltd., 1, French St., Sunbury-on-Thames, Middlesex. Sunbury 3.

## Gears—

Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham." East 49.

## Glue—

Central Chemicals, Ltd., 283, West End Lane, London, N.W.6. "Entramical, Westham." London.

Improved Liquid Glues Co., Ltd., Gt. Heretage Street, E. (Croid.). "Excroid-Wapp, London." Avenue 31.

Mendine Co., 8, Arthur Street, E.C. Bank 38.

Oldroyd, Wm., & Sons, Ltd., 9, Mincing Lane, E.C.2. E.

## Goggles—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Pic." London. Regent 13.

## Heating and Ventilating—

Chas. P. Kinnell & Co., Ltd., 65 & Southwark Street, London, S.E.1. "Kin." London. Hop 372 (2 l).

## Hollow Spars—

McGruer Bentwood Hollow Spar Co., Ltd., Commercial Wharf, Lambeth, S.E. "Gabriel, son, Watloo, London." Hop 7.

Robert Young Construction Co., Ltd., Canonbury Works, Canonbury Street, Essex Road, London, N.1.

## Instruments—

British Wright Co., Ltd., 33, Chancery Lane, W.C.2. Holborn 13.

## Instruments (Scientific, All meters, etc.)—

The Cambridge Scientific Instrument Co., Ltd., Cambridge. "Instrument, Cambridge." Cambridge 6.

Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, Phone, London." Walthamstow.

## Machine Tools—

Brewster & Co., 11, Queen Victoria Street, E.C.4. "Circumfuse, Cannon, London." City 1.

## Magneto Driving Pieces—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Magnetos—

The M-L Magneto Syndicate, Ltd., Victoria Works, Coventry. "Corton, Coventry." Coventry 1008.

The British Lighting & Ignition Co., Ltd., 204, Tottenham Court Road, W.1. "Vmag, Phone, London." Museum.

## Metal Manufacturers—

Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 4.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

## Metals in General—

Guthrie, J. B., & Son, 30, St. Mary Axe, E. Samuel Mercer & Co., 198, Upper Th Street, E.C.4. "Reconciled, Cannon, don." City.

Pritt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fen, London." Avenue 995, 996, and

## Metal Parts and Fittings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

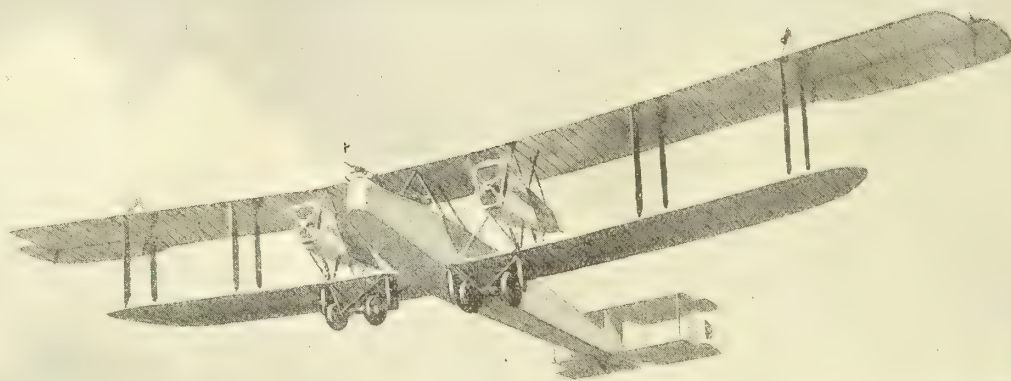
Aircraft Supplies Co., Ltd., Ascol House, Long Acre, W.C.2. "Upcast, R. London." Gerrard 276 (2 l).

Arnott & Harrison, Ltd., Hythe Road, W. den Junction. Willesden 1.

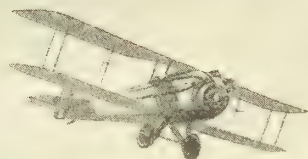
Bayliss, Jones & Bayliss, Ltd., Wolverhampton. (Bolts and Nuts.) "Bayliss, Wolverhampton." Wolverhampton 1.



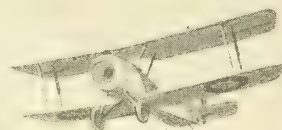




HANDLEY PAGE



SPAD



SOPWITH 'PUP'



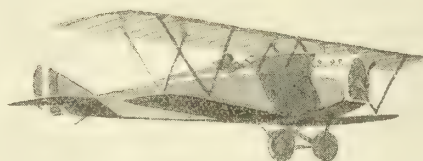
F.E.8



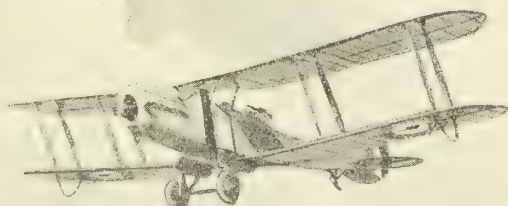
R.E.8



de HAVILLAND 5



S.V.A.

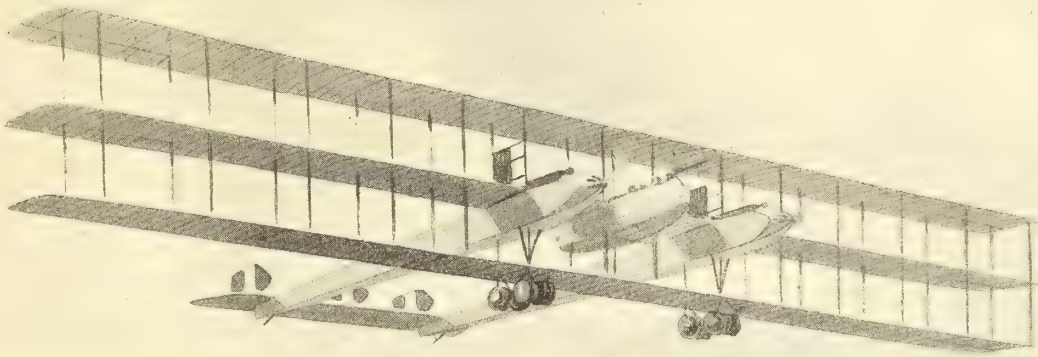


BRISTOL 'FIGHTER'

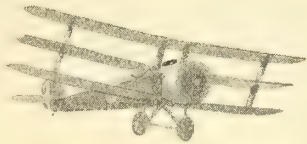


Representative Allied

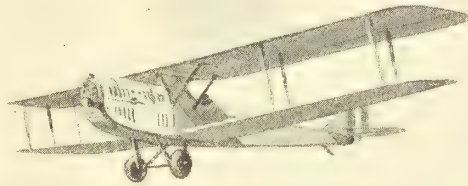




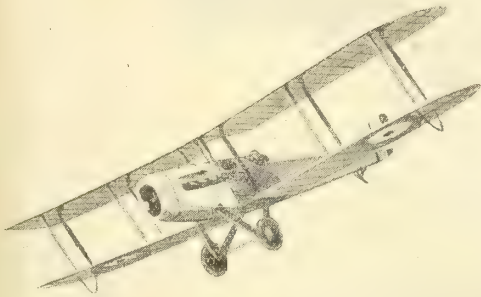
CAPRONI



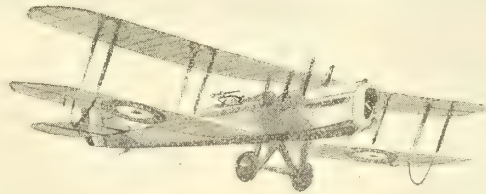
SOPWITH



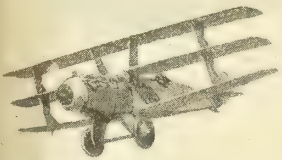
S.I.A



MARTINSYDE



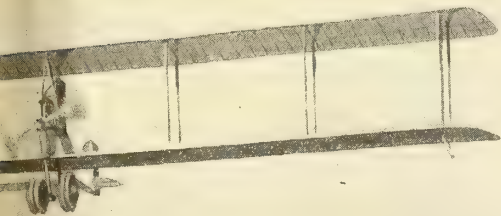
de HAVILLAND 4



CURTISS



SOPWITH 'CAMEL'



CAPRONI



'HORACE' FARMAN

GEORGEY WATSON







HANDLEY PAGE



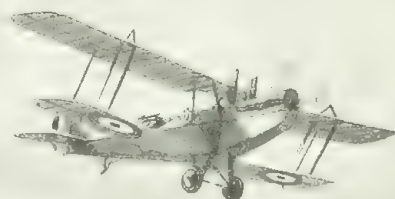
SPAD



SOPWITH 'PUP'



F.E.8



R.E.8



de HAVILLAND 5



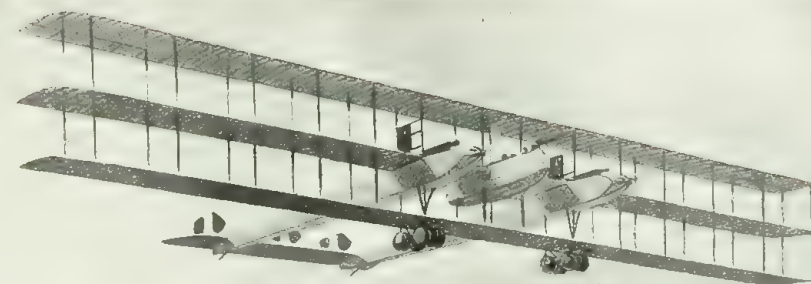
S.V.A.



BRISTOL 'FIGHTER'



CAPRONI



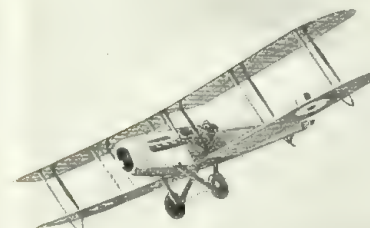
CAPRONI



SOPWITH



S.I.A.



MARTINSYDE



de HAVILLAND 4



CURTISS



SOPWITH 'CAMEL'



'HORACE' FARMAN

GEOFFREY WATSON

# Representative Allied Aeroplanes of 1917.





# BUYERS' GUIDE

## Metal Parts and Fittings (contd.)—

The Birmingham Guild, Ltd., 45, Gt. Charles Street, Birmingham. "Handicraft." Central 3705.  
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).  
The British Gold Shell Ring Co., Ltd., Inverness Road, Hounslow, London. "Golshel, Hounslow." Hounslow 254.  
British Metal (Kingston), Ltd., Kingston-on-Thames.  
Guthrie J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.  
Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Eus-road, London." Museum 70.  
Mountford, Fredk., Ltd., Fremo Works, Lifford, Birmingham. "Fremo, Birmingham." Kings Norton 261.  
Robertson, J. H., & Co., 1, Albemarle Street, London, W.1. Regent 3906.  
Rubery, Owen & Co., Darlaston South Staffs.  
Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66.  
The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. Regent 1181.  
The Aircraft Construction Co., Harley Works, Beckton Road, E.16. "Aerocrasons, Canning, London." East 1300.  
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.  
Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston." Bilston 10.  
Wooler Engineering Co., Ltd., Old Oak Common Lane, Willesden Junction, N.W.10.

## Metal Shearing Tools—

Monigomery, Smith, & Co., Ltd., Tangent Works, Keynsham, near Bristol. "Ingenuity, Salford." Keynsham 21.

## Metal Spinnings—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Metric Bolts—

Shimmo Bros., Zota Works, Hildreth Street, Balham, S.W. Battersea 415.  
Libery Owen & Co., Darlaston, South Staffs.

## Millcellaneous—

Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast." Belfast 4033-4034-4035.  
North-Glare Glass Co., Ltd., 76, Turnmill Street, E.C. Central 3734.  
Widen Wire, Ltd., Willesden Junction, "Boswell, Harles, London." Willesden 2400 (3 lines).  
British Metal (Kingston), Ltd., Kingston-on-Thames.  
Brown Bros., Ltd., Great Eastern Street, E.C.1. "Imbrowned, Bethroad, London." London Wall 6300.  
Endolithic Manufacturing Co., Ltd., 614, Fore Street, London, E.C.2. Labels in Metal, Ivory, Ivoryine, etc.  
Herbert Frood Co., Ltd., Chapel-en-le-Frith. "Froodbrake, Birmingham." Central 793.  
Laso Manufacturing Co., Ltd., 211, City Road, E.C. City 9558.  
London Label Co., Ltd., Harley Works, Beckton Road E.16. "Nonflamoid" Noninflammable Celluloid. "Lonlabel, Canning, London." East 1300.  
MacLennan, J., & Co., 30, Newgate Street, E.C.1, and at Glasgow. Tapes, Cords and threads. City 3115.

## Motor Cars—

Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.  
Mann, Egerton & Co., Ltd., 370/381, Euston Road, London, N.W.1. "Manegear, Eus-road, London." Museum 70.  
Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 530 (4 lines).

## Nameplates and Labels—

British Metal (Kingston), Ltd., Kingston-on-Thames.  
Endolithic Manufacturing Co., Ltd., 614, Fore Street, London, E.C.2.  
The Clegg Metal Engraving Co., Chatsworth Works, Worthing. "Clegg Worthing." Regent 1340.

## Observation Panels—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

## Parachutes—

E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemalivo, Ave, London." London Wall 3266-3267.

## Pattern Making—

Fredk. Ward, 6, 7 and 8, Allsop Street, Upper Baker Street, W. Padd 4743.

## Piston Rings—

British Chuck & Piston Ring Co., Coventry. "Rings, Coventry." Coventry 723.

## Power Presses and Dies—

Eliss, E. W., & Co., 21, Pocock Street, Blackfriars Road, London, S.E.1. "Blissdon, London." Hop 4340.

## Dresswork—

Rubery Owen & Co., Darlaston, South Staffs.  
Terry Herbert & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Propellers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).  
Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.  
Ebor Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames. "Ebor, Kingston." Kingston 672.  
Integral Propeller Co., Ltd. "Aviprop, Hyde, London." Hendon 9. Kingsbury 104.  
Lang Propeller, Ltd., Weybridge. "Aerosticks, Weybridge." Weybridge 520-521.  
Mann, Egerton & Co., Ltd., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).  
Oddy, W. D., & Co., Leeds. "Aircscrews, Leeds." Central 291, Leeds.  
Stanley Aviation Co., 67, Kingsland Road, E.2. City 8347.  
Westland Aircraft Works, Yeovil. "Aircraft, Yeovil." Yeovil 129.

## Pyrometers—

The Foster Instrument Co., Letchworth, Herts. Foster Instruments, Letchworth. Letchworth 26.

## Rigging for Aircraft—

Craddock, Geo., & Co., Ltd., Wakefield, England. "Craddock, Wakefield." Wakefield 406 (3 lines).

## Rubber Tubing & Accessories—

Hancock, James Lyne, Ltd., 266, Goswell Road, London, E.C.1. "Masticator, Isling, London." City 3811 and 3812.

## Safety Belts—

Holmes, C. H., & Son, 38, Albert Street, Manchester. "Semloh, Manchester." City 4432.

## Seaplane Manufacturers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay, 345 (3 lines).  
Mann, Egerton & Co., Ltd., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).  
The Norman Thompson Flight Co., Ltd., Middleton, Bognor. "Soaring, Bognor." Bognor 48.  
Short Bros., Rochester. "Seaplanes, Rochester." Chatham 627.  
Supermarine Aviation Co., Ltd., Southampton. "Supermarine, Southampton." Southampton 1337.

## Searchlights and Landing Lights—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).  
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

## Seats for Aeroplanes—

Bowser, E., Art Cane Works, 50 Park Lane, Leeds. Central 3473.

## Shackles—

The British Gold Shell Ring Co., Ltd., Inverness Road, Hounslow. "Golshel, Hounslow." Hounslow 254.  
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

## Sheet Metal Pressings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).  
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345.  
W. H. Briscoe & Co., Ltd., 51 and 52, Park Street, Birmingham. "Brisk, Bham." Central 550.  
British Metal (Kingston), Ltd., Kingston-on-Thames.  
Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.  
London Aluminium Co., Ltd., Westwood Road, Aston, Birmingham. East 407 Birmingham.  
Rubery Owen & Co., Darlaston, South Staffs.

## Sheet Metal Work—

British Metal (Kingston), Ltd., Kingston-on-Thames.  
Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adapt, Birmingham." Central 733 (3 lines).  
Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.  
Rubery Owen & Co., Darlaston, South Staffs.  
The Acetylene Corporation of Great Britain, Ltd., 40, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.  
The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. Regent 1181.

## Shock Absorbers (Elastic Cord)—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Sparkling Plugs—

Lodge Sparking Plug Co., Ltd., Rugby. "Igniter, Rugby." Rugby 245.  
Ripault, Leo, & Co., Ltd. (Oleo Plugs), 644, Poland Street, W.1. "Ripault, Reg, London." Gerrard 7758.

## Spring—

Dart Spring Co., West Bromwich. "Dart, West Bromwich." West Bromwich 322.  
Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.  
Terry Herbert & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61 (3 lines).

## Stampings—

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

## Steel—

Firth, Thos., & Sons, Sheffield. "Firth, Sheffield." Sheffield 3230 to 3237.  
Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.  
Nicklin, Bernard, & Co., Birmingham. "Bernico, Birmingham." Smithwick 224.

## Steel Tension Wires—

Craddock, Geo., & Co., Ltd., Wakefield, England. "Craddock, Wakefield." Wakefield 406.

## Steel Tubes for Aeroplanes—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

## Taper Pins—

Mountford, Fredk. (Birmingham), Ltd., Fremo Works, Lifford, Birmingham. "Fremo, Birmingham." King's Norton 261-262.

## Tapes and Smallwares—

Brown, Percy, & Co., 49, Newgate Street, London, E.C.1. "Ominate, Cent, London." City 4659.  
MacLennan, John, & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.  
James North Hardy & Son, Ltd., 54, Portland Street, Manchester. "Hardsen, Manchester." Central 6471.

## Timber—

Engineering Timber Co., Ltd., 9, Victoria Street, London, S.W. "Entikosit, Vic, London." Victoria 5073, 4210.  
Brown, R. F., & F. W., Wollaton Saw Mills, near Nottingham. "Brown's Saw Mills, Wollaton." Nottingham 1526.  
J. Owen & Sons, Ltd., 199a, Borough High Street, S.E.1. "Bucheron, London." Victoria 1310.

## Time Recorders—

Gledhill-Brook Time Recorders, Ltd., 26, Victoria Street, S.W.1. Victoria 1310.

## Turnbuckles—

Rubery Owen & Co., Darlaston, South Staffs.

## Tyres and Wheels—

The Palmer Tyre, Ltd., Shaftesbury Avenue. "Tyricord, Westcent." Gerrard 1214 (5 lines).

## Undercarriages—

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

## Varnishes—

The British Emailite Co., Ltd., 30, Regent Street, S.W.1. "Ridleyren, Piccy, London." Gerrard 280.  
Clark, R. Ingham & Co., Walter House, Bedford Street, Strand, W.C. "Pearline, Westrand." Regent 3923.  
Harland, W., & Son, Merton, London, S.W.19. "Harland, Wimbledon 45." Wimbledon 45 and 1395.

## Vices—

C. and J. Hampton, Ltd., Sheffield. "Vices, Sheffield." Attercliffe 95.

## Washers—

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.  
Herbert Terry & Sons, Ltd. Redditch. "Springs, Redditch." Redditch 61.

## Watchmakers and Jewellers (Silver Models)—

Goldsmiths' & Silversmiths' Co., Ltd., 112, Regent Street, W.1. Gerrard 4001 (3 lines).

## Welding and Cutting Plant—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

## Welding Repairs—

Barinar, Ltd., 10, Poland Street, W.1. "Barinquamar, Reg, London." Gerrard 817.  
The New Welding Co., 26, Rosobery Avenue, London, E.C.1. "Wondoneida, Holb, London." Holborn 5252.

## Wind Shields—

Auster, Ltd., 133, Long Acre, W.C. "Win-flector, London." Regent 5910.  
London Label Co., Ltd., Hadley Works, Beckton Road, E.16. "Nonflamoid" Noninflammable Celluloid. "Lonlabel, Canning, London." East 1300.  
Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

## Wire Gauze—

N. Greening & Sons, Ltd., 16, Finsbury St., London, E.C.2. "Setscrew, Finsquare, London." London Wall 1082.

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

## Wires and Cables (Aeroplanes)—

Braytons, Musselburgh, Scotland. "Wire-mill, Musselburgh." Musselburgh 28.

Craddock, Geo., & Co., Ltd., Wakefield, England. "Craddock, Wakefield." Wakefield 406 (3 lines).

## Wirework—

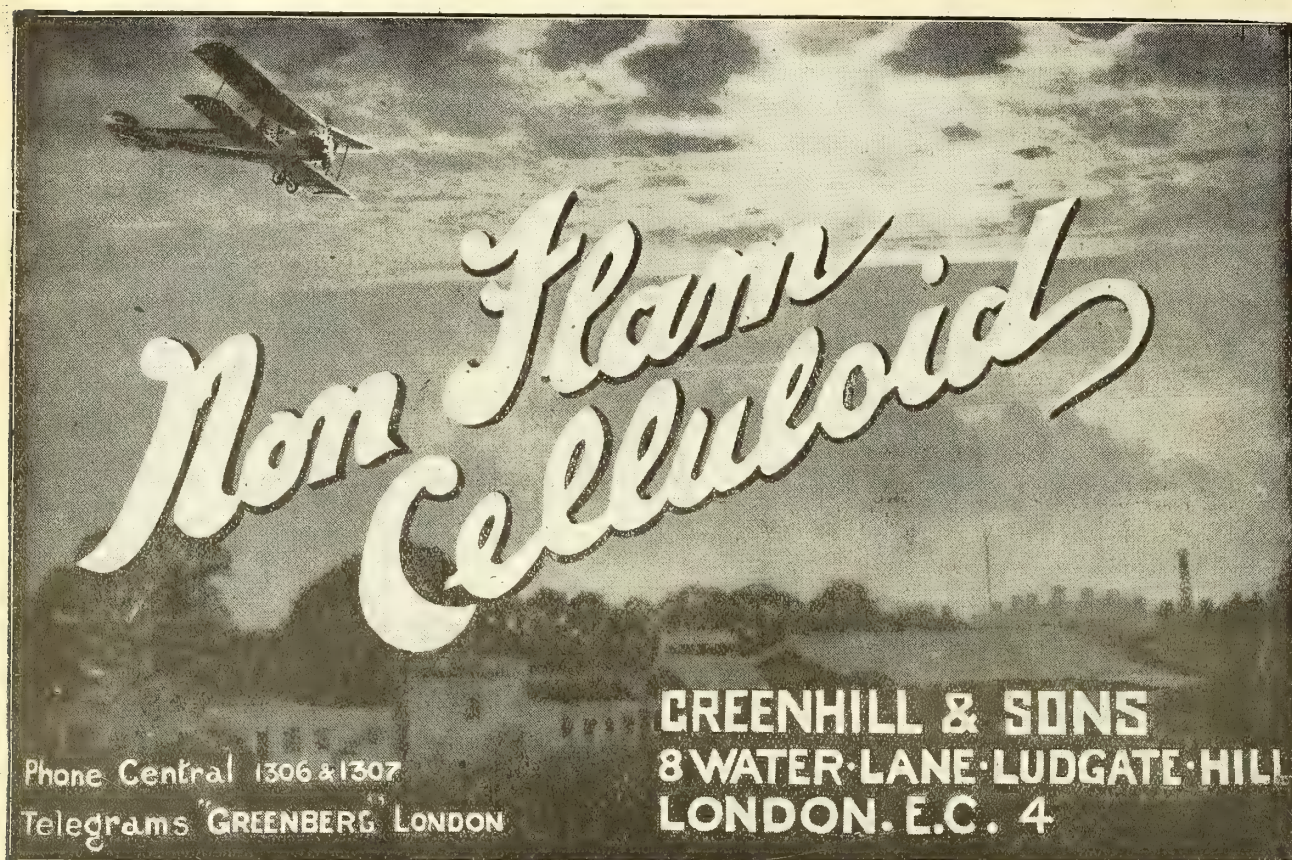
Terry Herbert & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Woodworking Machinery—

Robinson, Thomas, & Son, Ltd., Railway Works, Rochdale. "Robinson, Rochdale." Rochdale 467.

Sagar, J., & Co., Ltd., Halifax. "Sawtooth, Halifax." Halifax 136.  
Wadkin & Co., Leicester. "Woodworker, Leicester." Leicester 3611.





**Non-Flamm  
Celluloid**

Phone Central 1306 & 1307  
Telegrams "GREENBERG" LONDON

**GREENHILL & SONS**  
**8 WATER-LANE LUDGATE-HILL**  
**LONDON. E.C. 4**

# **DELACOMBE, MARECHAL & HERVIEU**

LIMITED

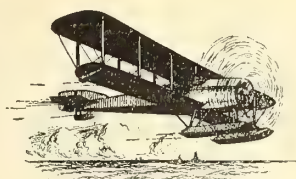
166, PICCADILLY, LONDON, W.1.

Telephone: 3031 Regent.

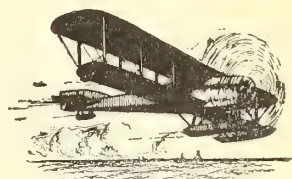
**HANGARS FOR AIRSHIPS, AEROPLANES AND  
KITE BALLOONS**

CONTRACTORS TO THE  
ADMIRALTY & WAR OFFICE





**JOSEPH EVANS & Co., LTD.**  
LIVERPOOL STREET MILLS,  
BIRMINGHAM.



Manufacturers of  
COMPONENT PARTS USED ON

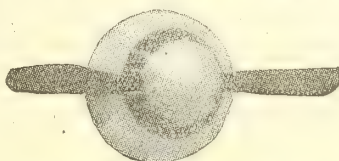
AERO ENGINES & AIRSHIPS.

**SHORT and FAIREY SEAPLANES.**

SPAD and H. FARMAN.

**D.H. 4 & 9 MACHINES.**

SOPWITHS.



FLYING BOATS.

**AIRSCREWS.**

TELEPHONE: CENTRAL 733.

TELEGRAMS: "ADEPT, BIRMINGHAM."

**NIEUPOORT**

AND

**GENERAL AIRCRAFT COMPANY, L<sup>TD.</sup>**

CONTRACTORS TO H.M. GOVERNMENT

OFFICE AND WORKS—  
**LANGTON ROAD,**  
**CRICKLEWOOD, LONDON, N.W.2**

TELEPHONE (3 LINES)—  
WILLESDEN 2455

TELEGRAMS—  
NIEUSCOUT, CRICKLE, LONDON

**HIGH-CLASS**  
**ALUMINIUM CASTINGS**  
**FOR ALL TRADES.**

We Specialise in Aluminium Cylinders and  
 General Aero and Motor Engine Castings.

**CAST IRON CYLINDERS**

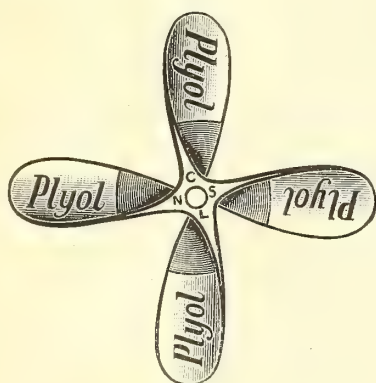
Water and Air-cooled for Aero and Motor Engines.

*All the above Castings to Government Specification.*

**WILLIAM MILLS, LTD.,**  
**Atlas Works, Grove Street, Birmingham.**  
**ALUMINIUM AND IRON FOUNDERS.**

**"PLYOL"**

THE  
**BEST CEMENT**  
 FOR  
**THREE-PLY,**  
**Veneering, etc.**



Registered Trade Mark.

**ALDGATE CASEIN WORKS.**

**NIEUWHOF, SURIE & Co., Ltd.**

HEAD OFFICE:

**5, Lloyds Avenue, London, E.C. 3.**

Works:

**ALDGATE AVENUE, ALDGATE, E.C.**

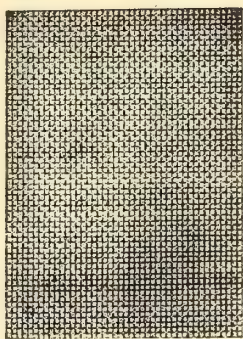
**Also Casein especially adapted for**  
**Waterproof Paints, Varnish, etc.**

Telephones:  
**AVENUE 34, 35.**

Telegrams:  
**'SURICODON, FEN LONDON.'**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





## AIR BOARD STANDARD PETROL GAUZE.

WOVEN WIRE CLOTH  
IN ALL METALS AND  
IN ALL MESHES AND STRENGTHS.

MANUFACTURED BY  
**N. GREENING & SONS, LTD.** ESTABLISHED 1799.  
LONDON WAREHOUSE—  
**16 FINSBURY STREET, E.C.2.**

Telegrams—"SETSCREW, FINSQUARE, LONDON."  
Telephone No.—LONDON WALL 1082.

WORKS - WARRINGTON.

CONTRACTORS TO THE ADMIRALTY.

Telegrams: "SUPERMARINE,"  
'Phone: WOOLSTON 37.

ESTABLISHED 1912.

# The Supermarine Aviation Works Ltd

Designers and constructors of Aircraft.

FLYING WATER & SLIPWAYS:  
**WOOLSTON**

H SCOTT-PAINE, GENERAL MANAGER.



OFFICES & WORKS:  
**SOUTHAMPTON**  
ENGLAND.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





# SAGE AIRCRAFT

TO design and build the finest aircraft—this was a problem made easier by reason of our finely equipped organisation. That we achieved **SUPREMACY** occasioned no surprise to those acquainted with our superlative skill in craftsmanship and designing

E. C. GORDON ENGLAND, A.F.Ae.S., Aviation Department  
**Fredk. SAGE & Co., Ltd., Peterborough, England**

**FREDK. SAGE & CO. LTD.**  
PETERBOROUGH, ENGLAND

## INCREASED OUTPUT DEMANDS GREATER ACCOMMODATION

To meet calls for accelerated production The  
**WILFLEY COMPANY** offers its services for  
the provision of Factory Buildings of all types in  
**STEEL, FERRO-CONCRETE, BREEZE  
SLABS, ASBESTOS SHEETS, BRICK**  
and other Construction.

*DESIGNS FOR COMPLETE FACTORIES IMMEDIATELY AVAILABLE.*

TEMPORARY STRUCTURES A SPECIALITY.

## The Wilfley Company, Limited

**SALISBURY HOUSE, LONDON WALL, E.C. 2.**

Telegrams : "Wrathless, Phone, London."

Telephones : City 2681 & 2682.



# ALUMINIUM CASTINGS

## OF EVERY DESCRIPTION.

We make a  
Speciality  
of  
Aeronautical  
and  
Automobile  
Work.

We are making many thousands of **Aluminium Die Castings** weekly under the celebrated **Cothlas** process—in many cases **entirely eliminating** machining operations, and we hold the sole manufacturing rights in the British Empire for this process.

Chemical and Physical tests are made on our own premises, and our **Castings**, both **Sand** and **Die**, are produced under the most up-to-date and scientific methods.

Sole makers of the **Birmal Aluminium Pistons**, thousands of which are running to-day in a highly satisfactory manner under the most severe conditions.

Highest  
Class  
Castings to  
Government  
Specifications.  
Prompt  
Delivery.

**BIRMINGHAM ALUMINIUM CASTING (1903) CO., LD.**  
**Cambridge Street Works, BIRMINGHAM.**

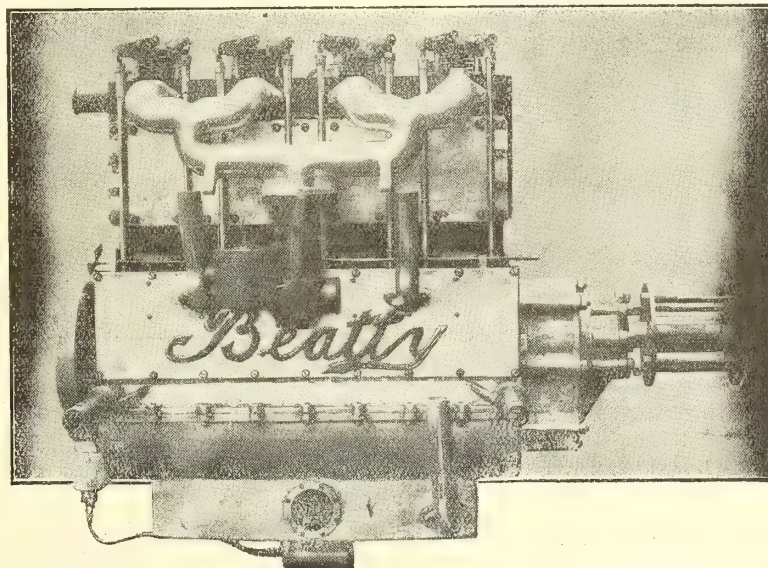
# The Beatty Monobloc Aero Engine

H.P. = 60.

R.P.M. = 1800  
Engine Shaft.

Prop. speed =  
1200 R.P.M.

Weight = 225 lbs



Petrol  
Consumption  
4.28 galls. per  
hour.

Oil  
Consumption  
.18 galls. per  
hour.

*Specially Designed and Developed for School Work.*

FULL PARTICULARS **The Beatty School of Flying Ltd.** LONDON AERODROME  
Telephone . . . . Kingsbury 138.

# B.G.L.

## METAL COMPONENTS FOR AIRCRAFT.

OIL, PETROL & GRAVITY TANKS  
FOR  
DEH 9, SOPWITH PUP, BRISTOL FIGHTER  
AND OTHER MACHINES.

THE BIRMINGHAM GUILD, LIMITED,  
GT. CHARLES STREET, BIRMINGHAM.

WE CAN DELIVER

# A.G.S. Shackles 158

Sizes A and B ————— In any

## QUANTITIES AT ONCE

---

:: :: The ACTUAL Manufacturers :: ::

## The British Gold Shell Ring Co. Ltd.

HOUNSLOW, MIDDLESEX.

— Telegraphic Address —  
"GOLSHEL, HOUNSLOW."

— Telephone —  
HOUNSLOW 254



# WARING & GILLOW LTD

**CONTRACTORS  
TO THE  
WAR OFFICE AND ADMIRALTY.**

**LIVERPOOL      HAMMERSMITH      LANCASTER**



**HEAD OFFICE  
OXFORD STREET  
W.1**

TELEPHONE No.:  
**HAMMERSMITH 1980**

TELEGRAMS:  
"Warings Factories, Hammersmith."

## WYCOMBE AIRCRAFT CONSTRUCTORS, Ltd.

HEAD OFFICE—57, LONDON RD.,

Telegrams - - Aircraft, High Wycombe.  
Telephone - - High Wycombe 84.

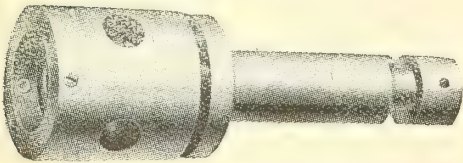
Receiving Office and Stores - HIGH STREET  
Tel. phone - - High Wycombe 120  
TIMBER YARD  
and Sawmills - - OXFORD ROAD

**HIGH WYCOMBE,  
BUCKS**

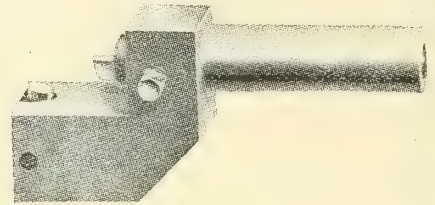
# CAPSTAN LATHE EQUIPMENT

**For Machining of Strainers, Eyebolts,  
Fork Joints, Turnbuckles, etc., etc.**

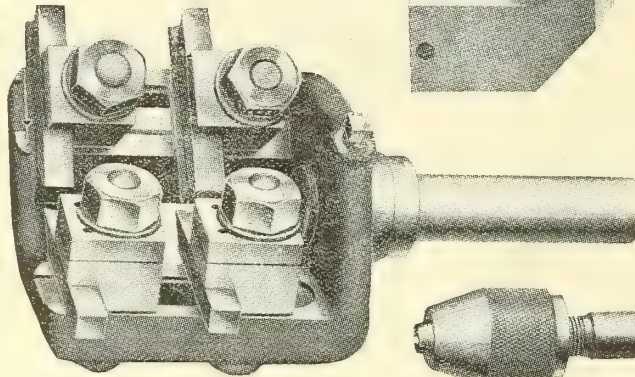
Self-releasing Die Holder.



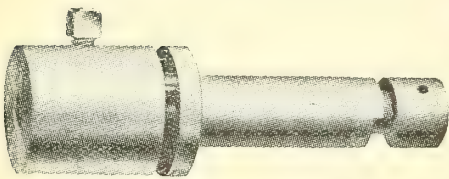
Knee Tool Holder.



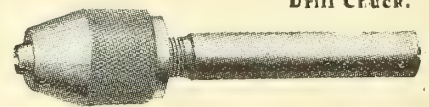
Box Tool Holder.



Self-releasing Tap Holder.



Drill Chuck.



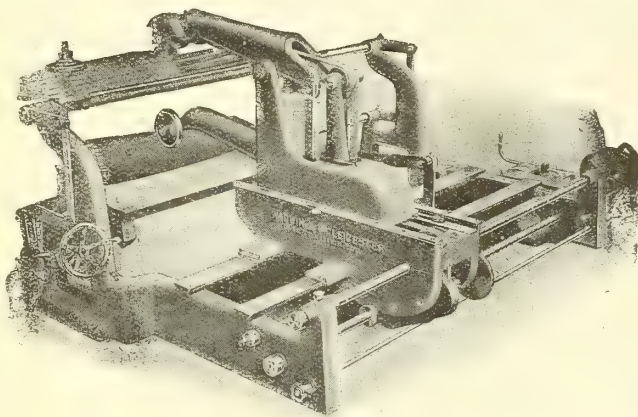
SPRING COLLETS, HOLLOW MILL HOLDERS, FACE FORM TOOL HOLDERS, ADJUSTABLE STOPS, &c., &c.

**IMMEDIATE DELIVERY.**

**HENRY J. BREWSTER & Co.,**  
11, QUEEN VICTORIA STREET, E.C.4.

Works: Goodmayes, Essex.  
Phone: CITY 768.

## INCREASE *your* Propeller Output!



Automatic Propeller Shaper, K.E.

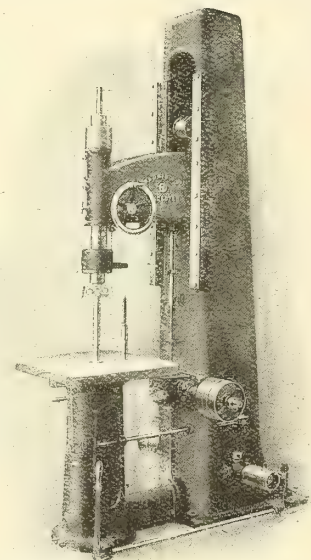
Some Advantages  
of our Shaper.

Every blade identical.

Less balancing  
required.

No scraps through  
careless shaping.

Work performed in a  
fraction of the time  
taken by hand.



Propeller Boring &amp; Recessing Machine, K.A.

WRITE FOR LIST OF USERS.

*Sole Makers and Patentees:*

**WADKIN & CO. LEICESTER**

Telegrams: "WOODWORKER," Leicester.

Telephones: 3614 and 3615.



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





CONTRACTORS TO H.M. GOVERNMENT.

**Enquiries Solicited for Woodwork.**

**Registered Offices:**

27, CHARLOTTE STREET,  
E.C.2.

**Works:**

28, CHARLOTTE STREET, E.C.2.  
NEW INN YARD, SHOREDITCH, E.C.2.  
126, GOSSETT ST., BETHNAL GREEN, E.C.

'Phone 7514 London Wall.

THE  
**GRAHAME-WHITE**  
AVIATION Co. Ltd.

AERONAUTICAL ENGINEERS & CONSTRUCTORS.  
CONTRACTORS to the ADMIRALTY & WAR OFFICE.

LONDON AERODROME, HENDON, N.W.9.

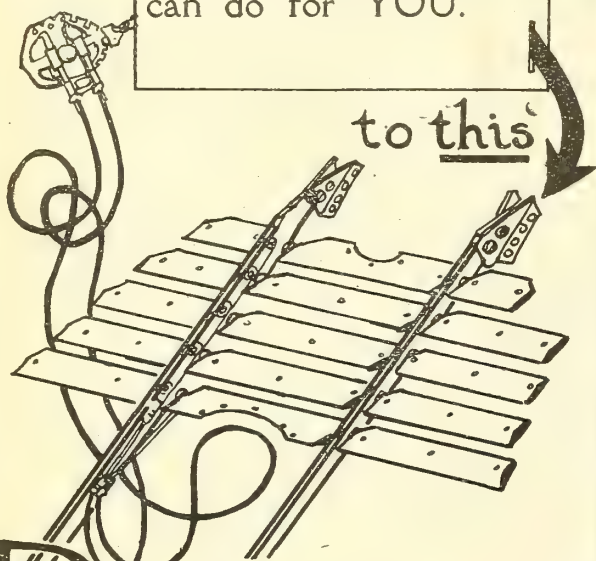
Proprietors of The London Aerodrome and the Grahame-White School of Aviation.



**From this**

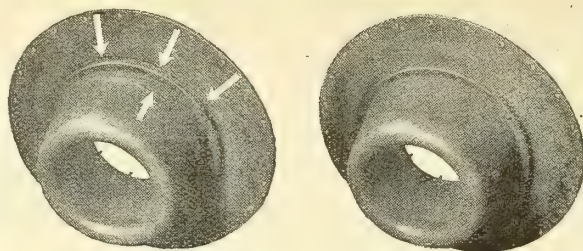
WHETHER the job be a simple pressed blank or it be an elaborate part that has to be made and assembled by us in its entirety, PULVO give it the utmost care and attention.

WE specialise only in giving satisfaction — apart from that any job in small part work, pressed or welded, filed, cut, turned or drilled, is the work we can do for YOU.

**to this**

**Pulvo Engineering**  
Co Ltd.

10-16 Dane St., Holborn. W.C.1.  
Phone. 410 Holborn — — — — —  
Telegrams: Pulvipult, Phone London.



*Left hand illustration shows Cast Iron Part of Gas Retort badly cracked round flange. On right hand the illustration shows repair complete, welded, machined, lined, faced and cleaned up. The actual time taken for repair was only a few hours.*

## Barimar Service to National Undertakings

ALL Public Works are operating under difficulties. Spare parts and replacements are exhausted, and the inevitable breakdown means a stoppage of work.

Barimar Welding Service has helped many Works Engineers out of tight corners and has made effective repairs to broken parts in a few hours, got the wheels running, and saved delays of several days or weeks in getting new parts.

Many Public Undertakings, including Electric Light and Power Stations, Water Pumping Plants, Sewage Works, Gas Works, Railways, Motor Bus Companies and Steamship Lines, rely upon Barimar Welding Service for many urgent repairs where replacement cannot be made from stock.

Barimar Scientific Welding Experts may be of similar service to you in emergency, and it is well to remember that Barimar can weld *any metal*, as every process of welding, including Electric, is employed in the works.

Whenever you need a welding repair made, think of Barimar. If you have any doubt about the job, telephone to us and get our advice. Letters and telegrams receive instant attention.

Barimar is at your service always, and, as you might like to know a little more about our work, we suggest that you send a Post Card for a booklet entitled, "How Barimar Performs Miracles"—a journalist's description of our works. The booklet is known as booklet "B.C." Please mention THE AEROPLANE.

Barimar guarantees all ordinary repairs against breakage under ordinary strain. Money back if repair is defective.

### A Note about Sending Repairs

Remove all fittings, label clearly with your name and address, and send carriage paid. Advise dispatch with instructions by post.

Address to:

Dept. B.C.

**BARIMAR**  
LIMITED,

10, Poland Street,  
Oxford Street, London, W.1.

Telegraph:  
Bariquamar, Reg., London.

Telephone:  
Gerrard 8173.



Contractors to H.M. Admiralty, War Office and Foreign Governments.

# The BRITISH CAUDRON

## CO. LTD.

SOLE BUILDING AND SELLING RIGHTS FOR

### Caudron Aeroplanes and Hydro-Aeroplanes

FOR

### THE BRITISH EMPIRE AND DEPENDENCIES

*Head Office and Works:*

**BROADWAY, CRICKLEWOOD, N.W.2.**

Cable and Telegraphic Address: "CAUDROPLAN, CRICKLE, LONDON."

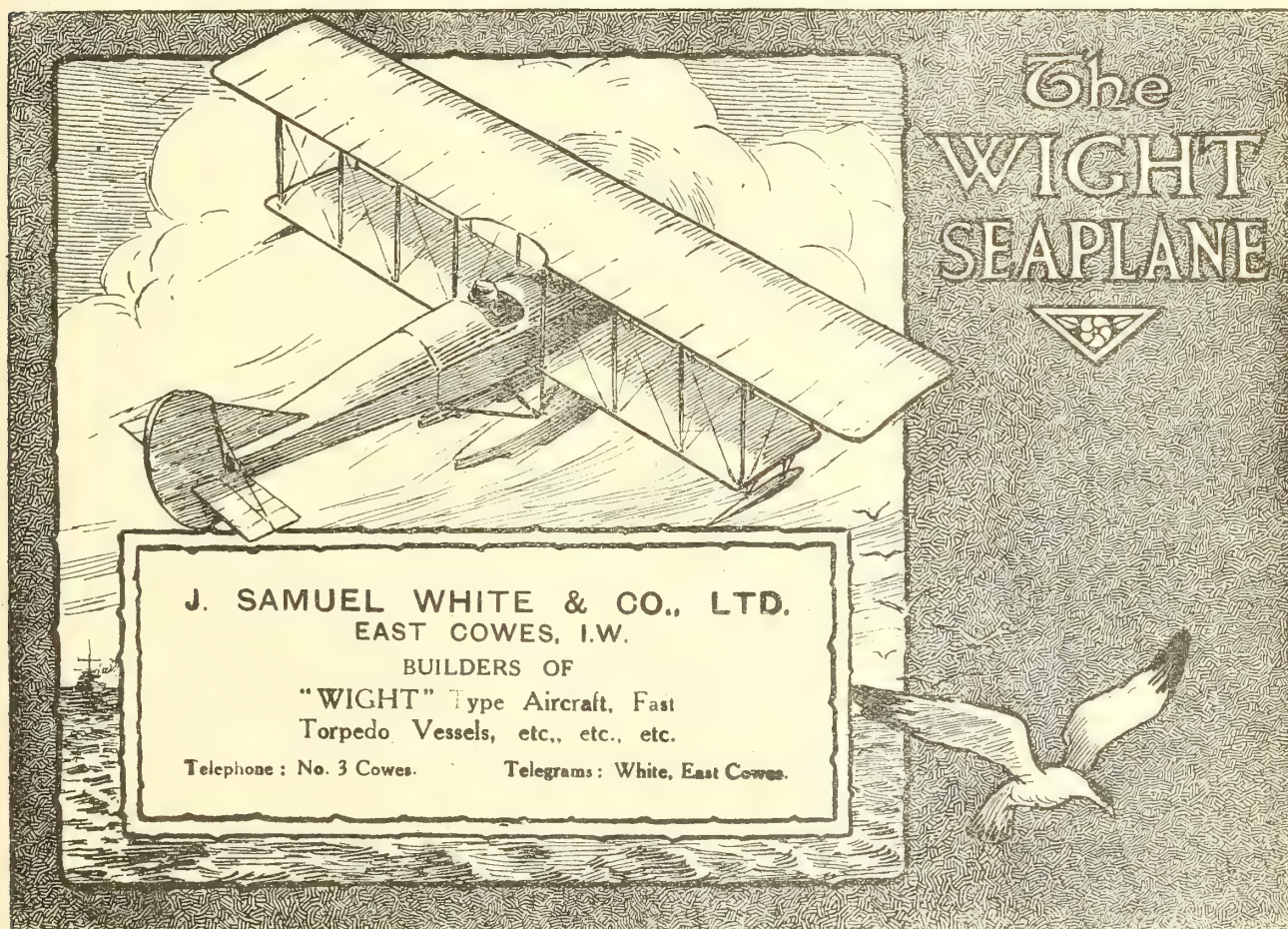
Phone: 4647  
4648 HAMPSTEAD

*Scottish Factory and Aerodrome:*

**ALLOA.**

Cable and Telegraphic Address: "CAUDROPLAN, ALLOA."

Phone: 52



The  
WIGHT  
SEAPLANE

**J. SAMUEL WHITE & CO., LTD.**  
EAST COWES, I.W.  
BUILDERS OF  
"WIGHT" Type Aircraft, Fast  
Torpedo Vessels, etc., etc., etc.  
Telephone: No. 3 Cowes.      Telegrams: White, East Cowes.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





# *VARNISHES . . .* *for* **AEROPLANES**

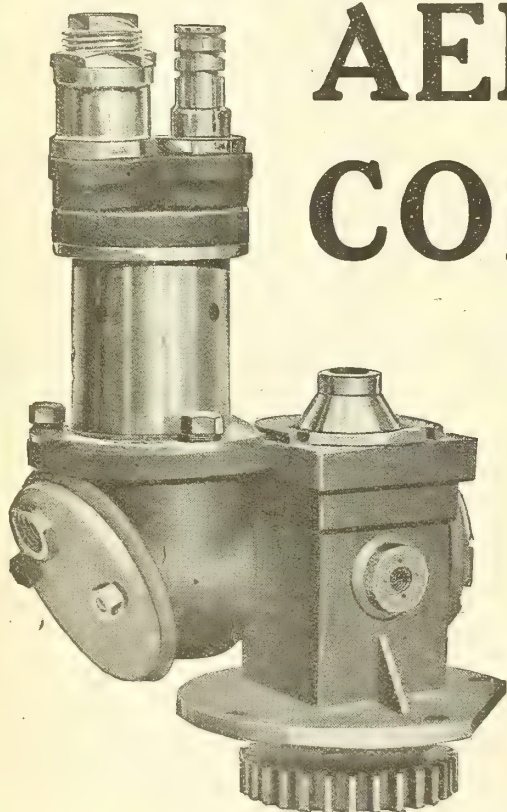
(SUBJECT TO A.I.D. INSPECTION)

**AIRSCREWS, SPARS, STRUTS, STAYS, ETC.**

**ROBT. INGHAM CLARK & CO. LTD.**

Offices: Walter House, Bedford St., Strand, W.C.2.  
Telegrams—Pearline, Westrand, London. Telephone—Regent 3923.

Works: West Ham Abbey, London, E.15  
Telephone—East 955, 956.



## **AERO ENGINE COMPONENTS**

MANUFACTURED BY THE

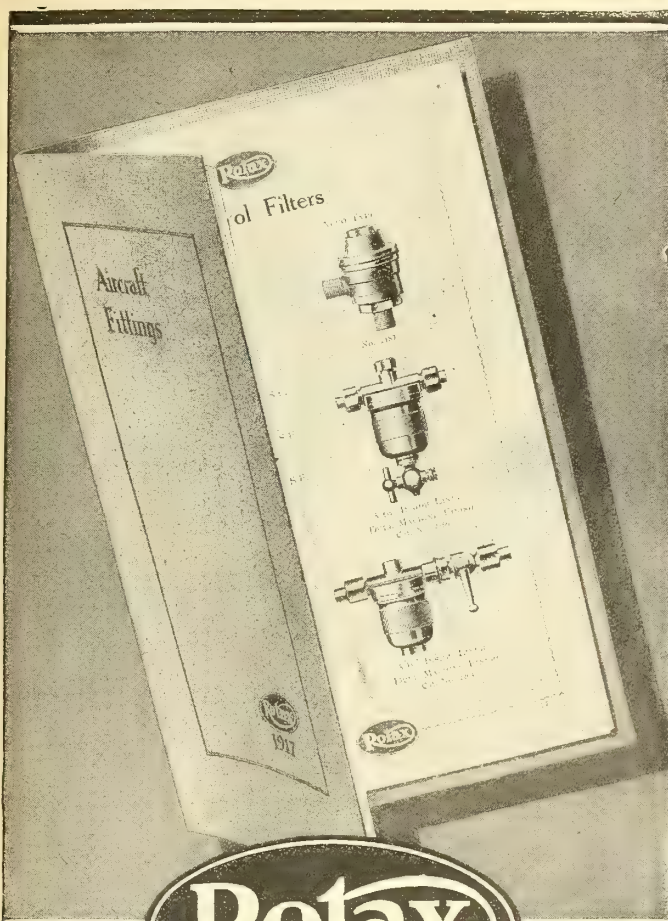
### **SELSDON**

**Aero and Engineering Co.  
Limited**

**IMPERIAL HOUSE,  
KINGSWAY, W.C.2.**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





## A Useful Book of Reference for Manufacturers

*A copy of the Catalogue illustrated above  
will be sent to manufacturers on application*

DETAILS ARE GIVEN OF OUR  
MANUFACTURES, COMPRISING :

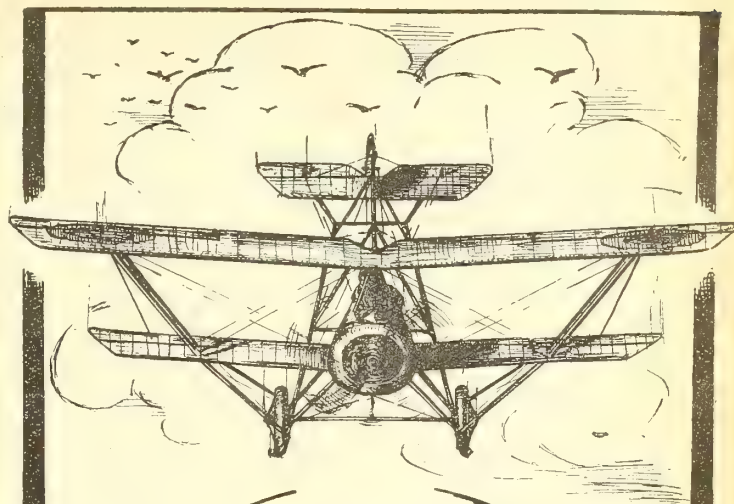
STREAMLINE WIRES AND FITTINGS, BRASS  
AND GUNMETAL FITTINGS, SHACKLES,  
AERO CLIPS, WIND SHIELDS, Etc., Etc.

*Special quotations on application to :*

**THE ROTAX MOTOR  
ACCESSORIES Co., Ltd.**

*Head Offices :*

**Rotax Works, Willesden Junction, N.W. 10**



If You Want  
**TO LEARN TO FLY,**  
Write to  
**THE**

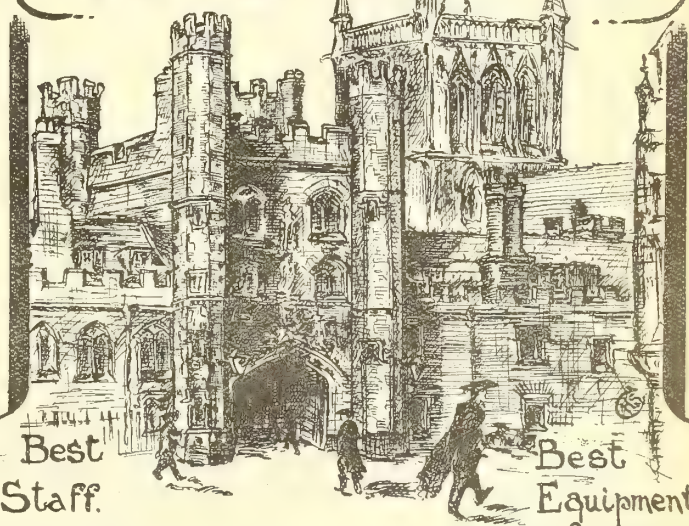
# CAMBRIDGE

**SCHOOL OF FLYING  
and Aerodrome Co., Ltd.,**  
306, St. Andrew's St., Cambs.,

## TUTORS

*of  
Piloting and Aero-engineering  
for their*

## 1918 PROSPECTUS.



Tel: Cambs. 5 and 1086.

Wire: "Carbon", Cambs..



Jewellers to



H.M. The King.



Royal Naval Air Service  
Badge Brooch, Gold and  
Enamel Crown, Palla-  
dium Albatross, £5 0 0

# Badge Jewellery

OF HIGHEST QUALITY.



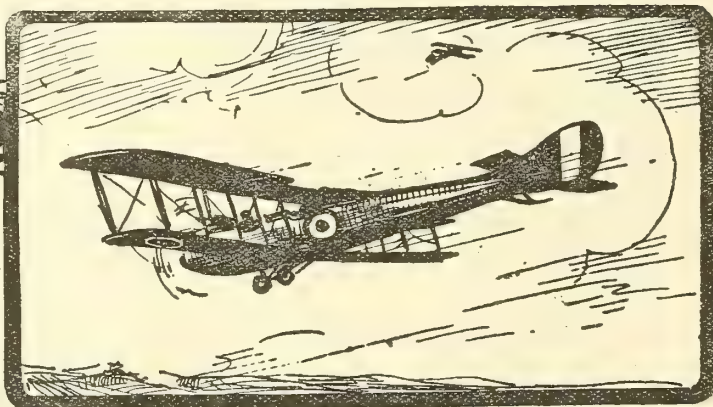
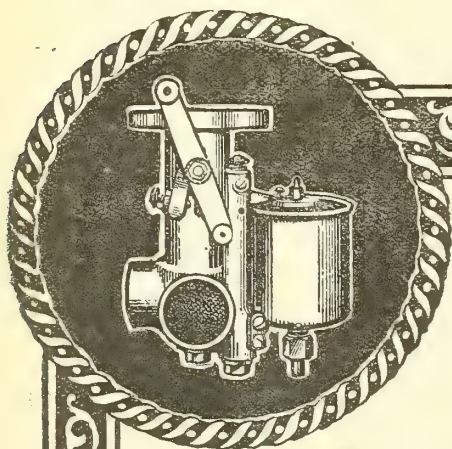
Royal Naval Air Service Badge Brooch, Diamonds,  
set in Palladium, with Ruby Eye - £65 0 0  
15-carat Gold, with Ruby Eye - £2 10 0



Royal Navy Cap Badge  
Brooch, 15-carat Gold  
and Enamel, £4 10 0  
Diamonds, set in Palla-  
dium, £47 10 0

The Badge Jewellery made by the Goldsmiths & Silversmiths Company is of finest quality, and is better value than can be obtained elsewhere. A fully illustrated Catalogue showing the comprehensive character of the Company's stock will be sent post free on application, or a selection of representative badges will be submitted for approval if desired at the Goldsmiths & Silversmiths Company's risk.

THE  
**GOLDSMITHS & SILVERSMITHS**  
**COMPANY LTD.** with which is incorporated  
The Goldsmiths' Alliance Ltd. Estd 1751.  
112, Regent Street, London, W.1.



# ZENITH

## CARBURETTER

Send for  
Illustrated Booklet.

**ZENITH CARBURETTER CO., LTD.** 40-42 Newman St. LONDON W.1.

Where swiftness,  
efficiency, and reli-  
ability are needed  
in the Government  
Service—there you  
will find the  
Zenith Carburettor

TEL. REGENT 487-49



# London Aircraft Co.

IMMEDIATE DELIVERY.

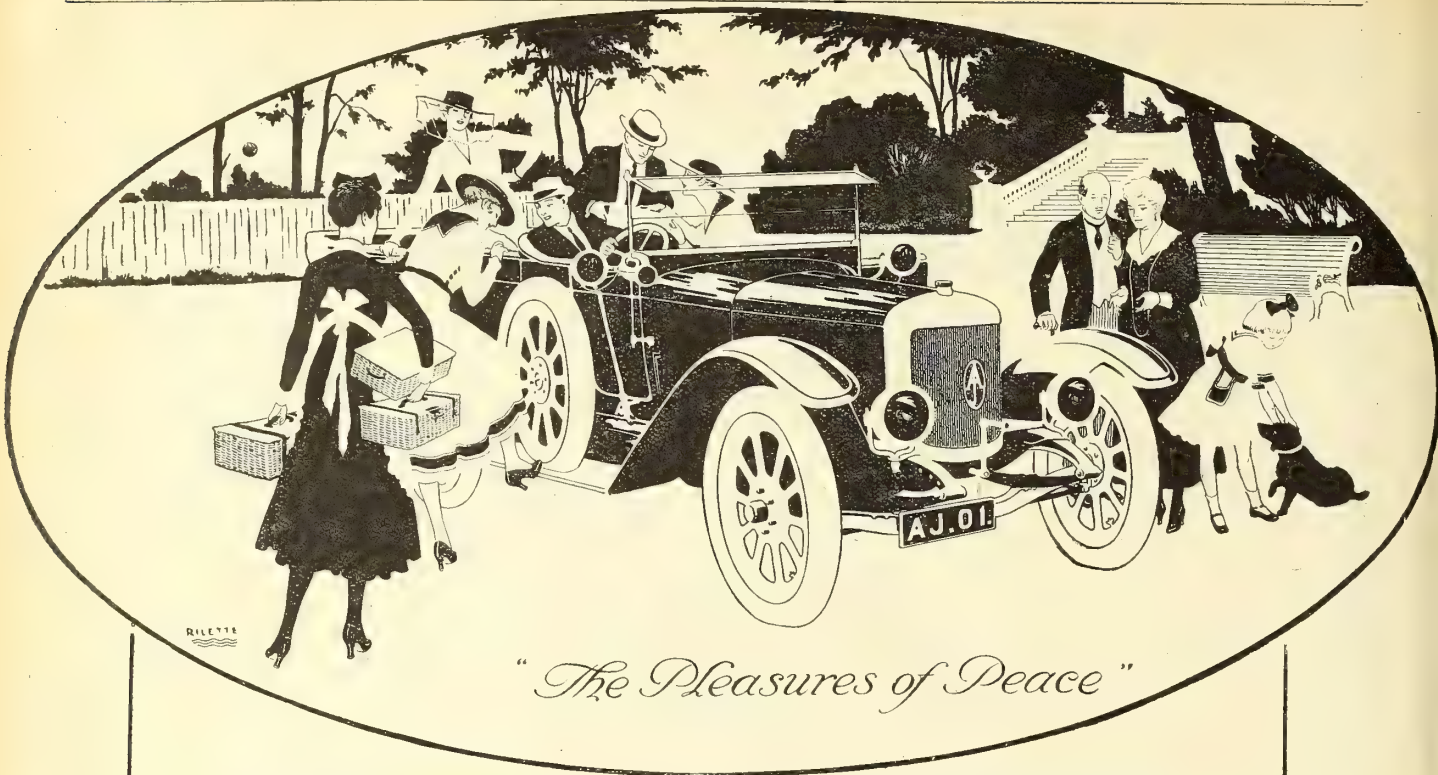
FIRST-CLASS WORKMANSHIP.

**Stampings, Machinery,  
Ashbends, Spars, and  
. Whole Components .**

General Manager:

**J. J. MORCH.**

**URSWICK RD., LOWER CLAPTON.**



*"The Pleasures of Peace"*

*The Arrol-Johnston Company extend to you the Compliments of the Season, and trust that the suggestion contained in this advertisement may soon be realised.*

**Arrol-Johnston**  
Ltd.  
**DUMFRIES.**

# ALLDAYS



## FURNACES—GAS, OIL, COAL or COKE FIRED.

**We make all kinds  
and for all purposes**

The illustration shows three Twin-Chambered Coal Fired Case Hardening Furnaces we have recently installed in an Aeroplane Factory.

Send for particulars to—

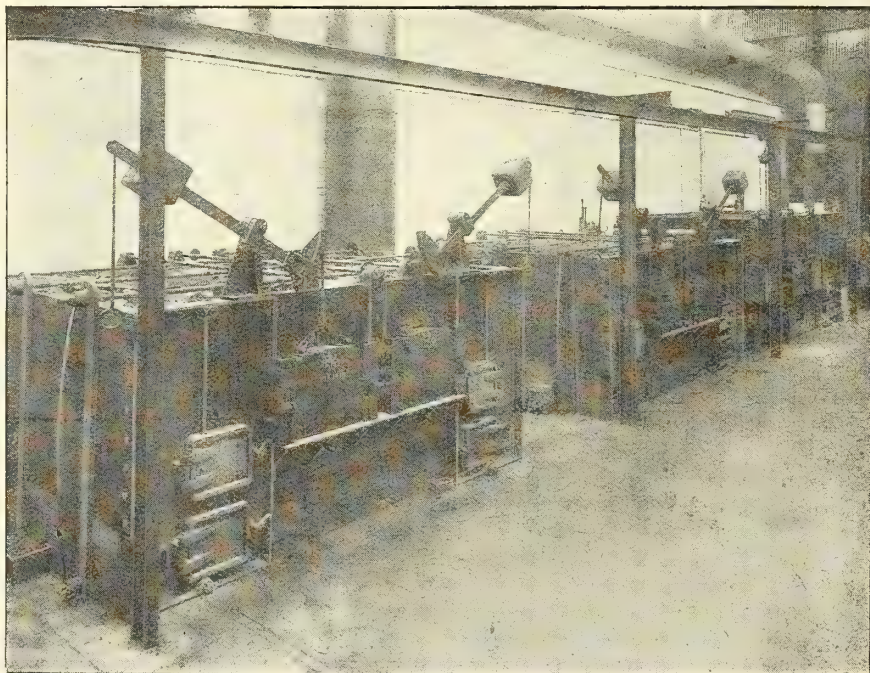
**ALLDAYS & ONIONS**

**PNEUMATIC  
ENGINEERING CO., LTD.,**

**Dept. KL, BIRMINGHAM**

and at

**58, HOLBORN VIADUCT  
LONDON, E.C.1.**



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



(Continued from page 42).

by taking a line of footprints given by research. To say that we want it, does not by any means ensure that it will proceed apace as it should. Research of various kinds is remunerative in two different ways: (a) quickly; and (b) eventually. Those studies which conduce to (b) rarely produce (a) a quick return. On the other hand, researches which afford us (a) are very likely indeed to be remunerative both quickly and eventually.

If we now subdivide the various researches which might forward aeronautics into two other classes—those (a) which result in some proprietary advantage to the inventor, and those (b) which have a general effect on progress, and which are not susceptible of being privately protected—we find that there is every inducement to the research worker to concentrate upon the class of improvement which I have called (a) in each of the above pairs of groups, that is to say, the device which can both be made proprietary, and which is remunerative quickly.

This must, unless we are very foreseeing and courageous, operate to deflect research workers from the other and frequently much more important class of study, viz., those which are of general application, and those which are eventually of great money value to the whole of the industry, whether of construction or of transport.

Patent laws stimulate advancement by providing that there shall be a reward, and that all and sundry shall not be able to possess themselves of the fruits of one man's labour, and thereby dispossess him. Means must be devised for securing that the British industry, as a whole, shall not be tempted to exclude from its study the great groups which I have classed as (b), which are so frequently not protectible by patent; and this business falls naturally to the new Department of Scientific and Industrial Research, who will, no doubt, find the hearty co-operation of the Society of British Aircraft Constructors and the Aeronautical Society. It is for the public to see that the determination towards progress exists, and then the outcome will first of all be the necessary funds, and thereafter the harvest of results and economies.

The Air Board has formed a Civil Aerial Transport Committee, which is engaged in considering these and most of the other matters dealt with in any such discussion as this, and if they recommend active steps to be taken, let us hope that there will be firm public support for any expenditure and assistance which shows proper foresight, always with the considered approval of the new Air Minister.

#### EDUCATION.

*Education.*—It is more than probable that by far the most effective step towards industrial peace, with which is bound up much more than ever the healthy development of our aerial fleet, is education, and this aspect of the matter forces us to include what is sometimes overlooked in technical circles when speaking of education—a good foundation of sociological and ethical subjects, as well as technical information. Perhaps one of the most important reasons for developing this side of education is that it will give the average reader a more critical outlook upon the average newspaper, and its somewhat unguarded statements. The effect of this critical outlook will, no doubt, be that a far higher technical standard and a more cautious statement of alleged facts will be developed, and in this way the educational effect of the Press will react to further the educational standards. It will not, we hope, be possible, a few years after the passage of Mr. Fisher's Act, for any person who pretends to a hearing to claim that there is a pool of wealth of limited rotil from which each and several draw as much as they can. That illusion is the foundation of the impression that the employees suffer by the employer being successful, and we shall all gradually come to accept that by restricting the production of wealth we diminish the chance we individually have of being wealthy.

The indirect abolition by Mr. Fisher's Act of the blind-alley occupation will have also the effect (since we have decided to be governed by a body which includes many of those who live blindly in blind alleys at present), that a more far-seeing electorate will have charge of our destinies. So far as the hand-workers in aircraft construction are concerned, they do not differ from the engineering trades generally, and the educational scheme which is good for the skilled fitter or carpenter is good for the aircraftsman. In the higher branches, e.g., the aeronautical designer, what is first wanted is a good engineering and sociological education, to which are to be superadded the specialities of his calling, a business largely to be achieved by familiarity in college or university with the work of the wind tunnel and whirling arm.

#### AIR ROADS.

*Routes.*—One of the things wanted now is some inquiry made experimentally by actual flight for the purpose of determining the best aircraft trader and postal routes which may be useful and eventually payable. London-Paris has been suggested, with extension to Marseilles, Turin, and Egypt. Links between

capitals have also been spoken of, and links with India and South Africa, etc. Short runs will probably come first. In all short distance runs the problem is complicated when the existing rail and steam facilities compete. There is a marked advantage for aircraft every time that transshipment of any kind occurs on the ordinary means of transit. This favours London-Paris and London-Dublin, for example. Similarly, and for similar reasons, whereas no great advantage might be gained by a London-Glasgow route, where the train travels at fifty miles per hour, and the journey can easily be done during the lost hours of the night without the traveller being roused from his sleeping berth, we shall find that cross-country journeys, those involving changes of train, waiting at stations for connections, will be instantly eclipsed in comfort and speed by aerial travel and aerial mail deliveries. One could suggest Cardiff and Newcastle, or the like.

I do not think that much is to be gained by suggesting routes at the present moment, unless we propose to permit a few machines to be withdrawn from war service, and then, by using a few pilots who are for one reason or another not fit for war service, explore the practical possibilities of such transport. I think it far better to start by carrying newspapers and letters, and packets, rather than passengers at first, for every reason. The routes will be unknown to the pilots, their experience may perhaps not be great—the advertisement expense needed to summon passengers to support the trial cannot usefully be made in war time, and, generally, it is not desirable, save in exceptional cases, to expend petrol for personal travel, or to expend money in adapting designs to passengers' comfort. Yet if this comfort were omitted, a false impression of the facilities to be afforded would easily get spread abroad.

I do not know whether certain types, whose performance is below the ever-rising requisites for war, could be made available, but I should have thought that with good will they could be managed, and if so, the experiments made in war-time would help us to start *quickly*, on declaration of peace, that which might eventually help to create orders—only a few it is true, but still a small fraction of what is wanted for the maintenance of the production factories.

#### FUTURE SPEEDS.

*Speed.*—I am inclined to endorse Mr. Holt Thomas's view that, if we consider the average wind speed as 30 miles per hour, sometimes with us and sometimes against, we shall need machines whose own air speed is 120 miles per hour, in the case when there is any competition with other means of transport.

On cross-country journeys far lower speeds will be vastly faster than the existing systems, and will at once command attention.

As we know, 120 miles per hour is a very ordinary speed today for aircraft, and offers no technical difficulties in alighting—indeed, Captain Green's interesting forecast, under certain conditions which he laid down, of an aeroplane to travel at 240 miles per hour, did not appear to raise any feeling of doubt or hesitancy at the Aeronautical Society about three weeks ago—though a similar audience in 1911 was very sceptical about the advisability of introducing, even for military purposes, my proposed speed of 72 miles per hour. This gives us an idea of the changes which have gone on in men's minds by legitimate extrapolations from the actual achievements with which they are familiar.

I have nearly finished, but before doing so I must once more reiterate that the most hopeful estimate for immediate aircraft transport and travel does not save the situation. There must be Governmental action to maintain the country's productivity and designing capacity for military and naval aircraft in the first place, and as the mainstay of the country's factory organisation.

#### A NEW ARENA.

In conclusion, it is only half a truth to say, with Frederick List, "The sea is the high street of the earth. The sea is the parade ground of the nations. The sea is the arena for the display of strength and enterprise of all nations." There is now the air. A great instrument of power tending to peace and usefulness and good will can be designed in a week, if only a British, a French, an American, an Italian plenipotentiary could be empowered to sit round a table. That instrument is the aerial way. Its regulations must not be founded now upon speculation, they must be evolved later upon experience.

All the Allied nations desire the same thing, all are agreed that just as in time of peace we must prepare for the catastrophe of war—so in war we must prepare our thoughts and plans for the cataclysm of peace. The word is used advisedly, for a very sinister situation will develop in the world of aircraft during the hiatus which first was publicly indicated, I think, by myself, in the discussion on Mr. Holt Thomas's paper before the Aeronautical Society, and which Lord Cowdray himself promised to make every effort to bridge.



## The Lord Hundred-Dollar Biplane.

(AN EXTRACT FROM THE HISTORY OF THE FUTURE.)

BY STOREY HOLLAND.

It was in the early summer of the year nineteen hundred and umpty-eleven that the first rumours foretelling the expected arrival of Henry Lord's Hundred-Dollar Biplane began to filter through the prevailing gloom. At that date some 50 per cent. of the adult male population of the world was suffering from chronic melancholia. This was indirectly due to the Great War.

It will be remembered that during the later stages of the whole of the cavalry and nearly all the infantry of the nations engaged were aerated; that is to say, trained and equipped for the Aërial Army.

Directly the fighting was over, the nations—and the British Isles in particular—turned their attention to other and more important matters. It was urgently necessary, for example, to give new names to the old political parties: to frame a commercial agreement designed to facilitate the import of German goods: to draft a proclamation decreeing Universal Brotherhood: to make Dora a permanent institution under another name: and to organise a Solemn Thanksgiving to the Censor for permitting the publication of the Peace Treaty.

With all these matters to attend to, the Government had no time to give to the development of Commercial Aeronautics. Aeroplane and aero-engine factories, unable to complete the payment of the taxes levied upon them as a return for their help in time of need, closed their doors, with a few trifling exceptions. These few continued to produce in very small quantities, at a very high price. None but the labouring classes could possibly afford the luxury of flight.

The millions who during the war had experienced in their own persons all the joys of a partridge on the First of November were obliged to descend to earth and crawl about on the rather inadequate complement of legs remaining for their use. The joys of the empyrean were no longer theirs. Hence the epidemic of melancholia, which, had it not been for Henry Lord, would have enveloped the whole world and terminated its history.

Henry Lord was a man of many parts. Jealous critics maintained that they did not all fit. There was some talk of loose screws, and many animadversions upon the cerebral situation of his water-tank. By inclination he was modest and retiring. He had, however, learnt the stern duty of subordinating inclination to necessity. And he had learnt it extremely well.

Imagine, then, his surprise and irritation when, on opening his morning paper, his eye met a paragraph somewhat as follows, only much more so:—

HENRY LORD SAVES THE WORLD AGAIN.

GREAT INVENTOR'S GREATEST SCOOP.

MILLIONAIRES MAKE MOTORS—BUT

BILLIONAIRE BUILDS BIPLANES.

We are informed that Henry Lord intends to design an aeroplane. The price is not yet fixed, but it will come within the reach of the most penurious capitalist. The quality will be such that even an unskilled labourer need not be ashamed to own one.

Henry Lord hastily tore open another half-dozen papers. The headlines varied, but the paragraph was everywhere. Sometimes it stood out in all its pristine

nakedness; at other times it was decidedly shrouded in voluminous folds of glittering adjectives. But, however it was worded, the gist of the thing was always the same. And the worst of it was that it was true. How, then, had the papers got to know of it?

\* \* \*

Lord ruminated for several hours over this problem, and at last the solution struck him right between the eyes. Only yesterday, when handing to his advertising manager a ten-million-dollar bill for the week's expenditure of that department, he had incidentally let drop a hint of his intentions. But who would have imagined that this trusted official would so far abuse his confidence?

However, the thing was done and he must make the best of it. He must lock up several of his engineers until a real 'plane had been designed. In the event of failure he must lock up more. Rather than be beaten, he would lock up the whole dam population! He was determined.

He set his jaw, was not satisfied with the setting, took it out, and set it again.

He would have gritted his teeth, but there was no grit about. He had to use an emery wheel.

He began to concentrate.

A sort of aura of inventive intelligence oozed out of his room and pervaded the whole factory, so that it hummed like a hive of bees. Some of it even got as far as the man in the street, and ideas sprung into existence everywhere.

All that day Henry Lord was busy inventing.

He gave no less than seventy-two interviews to the representatives of leading journals. Others he referred to assistants previously primed to express his views.

Contradictory statements went round the Press with the rapidity and quick-changeability of a kinematograph.

They blossomed in profusion under the nourishing warmth of declamatory headlines. "Good Lord," several papers commented. "Lord save us!" became a standard form of appeal. "Oh, Lord!" generally figured above those paragraphs which explained clearly that "there is absolutely no truth in the rumour, etc."

\* \* \*

Henry Lord's publicity department had long ago discarded its coat. Now it had thrown aside its shirt and was perspiring in the buff. Henry Lord still thought. *How* he thought! Presently thought suggested to him the advisability of opening the door of the room in which the engineers were confined.

They were all dead of suffocation.

The room possessed no windows or chimney. Henry Lord had two windows and a new lot of engineers firmly inserted, and issued articles explaining that the prolonged tests of the Great Invention were still in progress.

\* \* \*

Then the Works Poet was got busy. In next to no time he had turned out a beautiful paraphrase of the well-known national song which begins:

"Our eyes have seen the glory of the coming of the Lord,"

and had published it broadcast in seven languages.

Then the Joke Department was set to work under Henry Lord's personal supervision. It was unusually prolific. The first product was a riddle, "What does the owner of a Lord Biplane do when he wants to go



# B. A. S.

The letters B.A.S. mean Blackburn Aircraft Standard and refer to the well-known Metal Fittings produced by the Blackburn Aeroplane and Motor Co., Ltd. These letters have become synonymous with the highest quality, accuracy and reliability.

## ***Blackburn*** **AIRCRAFT**

Made by PIONEERS  
in the construction of  
Land machines and  
Seaplanes.

The BLACKBURN  
AEROPLANE and  
MOTOR CO., Ltd.

"Olympia,"  
LEEDS,  
and at Hull.

**"Always at the Front!"**

*Steele's Ad. Serv.*

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

for a fly?" The answer was "Walks to the nearest cab-rank." Henry Lord made this up himself, and all the others laughed.

\* \* \*

Henry Lord was so pleased that he let out the second lot of engineers. Most of them were alive, and they had done splendidly. They had evolved something really magnificent. They would have done better still, only Lord, in the hurry of inventive genius, had forgotten to tell them what he wanted before locking them up. As it was, they had completed the plans for a garden roller and a new sort of mouse-trap.

A third batch was immured, and Henry Lord got back to business. The price of the biplane was changed for the fifty-eighth time. It was turned into a monoplane, then into a triplane, and then back into itself. This let the Joke Department in with something about "Buy planes first, and try planes afterwards." They also got out three quite nice little smoking-room bits, that cannot be chronicled in a history book. The public was delighted.

In such subtle ways was expectation kept at fever heat, until the day came for the third lot of engineers to be set at liberty.

That was a great day, for it was found that they lay prostrate and gasping round a table upon which the impossible had been achieved.

\* \* \*

The designs were complete. The mouse-trap plans had been ingeniously utilised in setting out the fuselage.

Within an hour the huge factory was turning out complete biplanes at the advertised rate of 20,000 a day. In less than a year the first was ready to take the air.

It was at this juncture that a real live peer was imported from England, and wrote an article than transcended all previous efforts.

"The thing," he stated, "is simplicity itself. An

idiot could drive it. Probably some idiot *will* drive it. The mechanism can be understood by a baby. With a three-months course of instruction, I believe I could understand it myself. It is marvellous. So am I. The world will be for ever indebted to Henry Lord, and to me for telling it about him."

\* \* \*

It was then that—borne slightly above himself on the flood of adulation—Henry Lord made the one mistake of his life. He decided to demonstrate the first plane in person.

A long, straight road was cut up one side of a mountain. The other side was chopped away to form a precipice in which the road terminated. On either side of the road, but at a safe distance, and all along the edge of the precipice, grand-stands were erected. Millions of people were invited to attend. Henry Lord was determined that the affair should be carried through quietly and with dignity, but without a trace of ostentation.

The cars of the Press representatives filled an enclosure covering five square miles. Kinematograph operators were numbered in tens of thousands. Henry Lord's speech, delivered through a megaphone, was recorded verbatim by millions of flashing pencils. There was no interruption except the gentle "slick" of the moistened finger turning the page of the rapidly filling note-book, but at the conclusion the cheering was thunderous.

Henry Lord took his seat in the biplane. The kinema men completed their second reel. The engine was started. Willing hands pushed behind, and under their growing pressure the great machine gathered way and sped up the incline. Faster and faster it moved. The edge of the precipice was reached.

There was a hush of expectation and then a roar of applause, as Henry Lord and his biplane left the earth and crashed headlong into the valley below.

The world was saved!



SPEEDING UP AT THE SOPWITH AVIATION CO.

(Reproduced from a Sopwith Christmas Card.)

The Fuselage Erecting-shop at 11-51 p.m. on Dec. 30th. Trying to get the umptieth machine through in the old year. There is a saying that many hands make light work, but all hands seem to be painfully aware that the Devil takes the hindmost. Note the apprentice to the fine art trade in the centre of the picture, who has learned that the best way to become an artist is to grow long hair; also, the first-aid specialist. The machine in question is not the \$100 biplane!



# **May we Cover and Dope your Wings?**

**AERO COVERINGS, LIMITED**  
**TENNYSON WORKS**  
**WILLESDEN LANE**  
**KILBURN**  
**N.W.6.**

**Telephone :**  
**2202 Willesden**

**THE PATENTS INDEX.**

The subjoined list of recent inventions has been specially compiled by THE AEROPLANE from the current Official Patents Records.

**PATENT APPLICATIONS.**

- Adams, H. E. F. Balloons, etc. No. 18506. Dec. 13th.  
 Bates, C. Speed and navigation of aircraft. No. 1846e. Dec. 13th.  
 Dunlop Rubber Co. Landing-gear for aircraft. No. 18448. Dec. 12th.  
 Fairey Aviation Co. Controlling-devices for aeroplanes. No. 18443. Dec. 12th.  
 Ford, J., and others. Emergency parachute for airmen. No. 18272. Dec. 10th.  
 Foy, W. C. Aeroplanes. No. 18355. Dec. 11th.  
 Lanchester, F. W. Lateral plumb-indicator and vertical plane compass for aircraft. No. 18292. Dec. 10th.  
 Lanchester, F. W. Height-finder for ranging guns on aircraft. No. 18486. Dec. 13th.  
 Moore, J. K. Propellers for water and air craft. No. 18366. Dec. 11th.  
 Paris, A. V. Magnetic compasses for aerial navigation, etc. No. 18627. Dec. 14th.  
 Pensuti, E. Speed indicators for aircraft, etc. No. 18420. Dec. 12th.  
 Rapson, F. L. Means for propelling aircraft. No. 18371. Dec. 11th.  
 Schilowsky, P. Gyroscopic instrument for showing deviations of aircraft, ships, etc., from a set course. No. 18296. Dec. 10th.  
 Stevenson, W. J. Invisible aircraft. No. 18409. Dec. 12th.

COMPLETE SPECIFICATIONS ACCEPTED, PRINTS OF WHICH CAN BE OBTAINED ON AND AFTER JAN. 3RD, 1918.

- 111,691. April 26th, 1917. Hammond, E. V. Variable wing surface for aeroplanes.  
 111,747. Jan. 11th, 1917. Wade, H. Hydro-aeroplanes.  
 111,802. May 18th, 1917. Myers, A. W., and Fitzgerald, R. R. Parachute attachments for aerial machines.

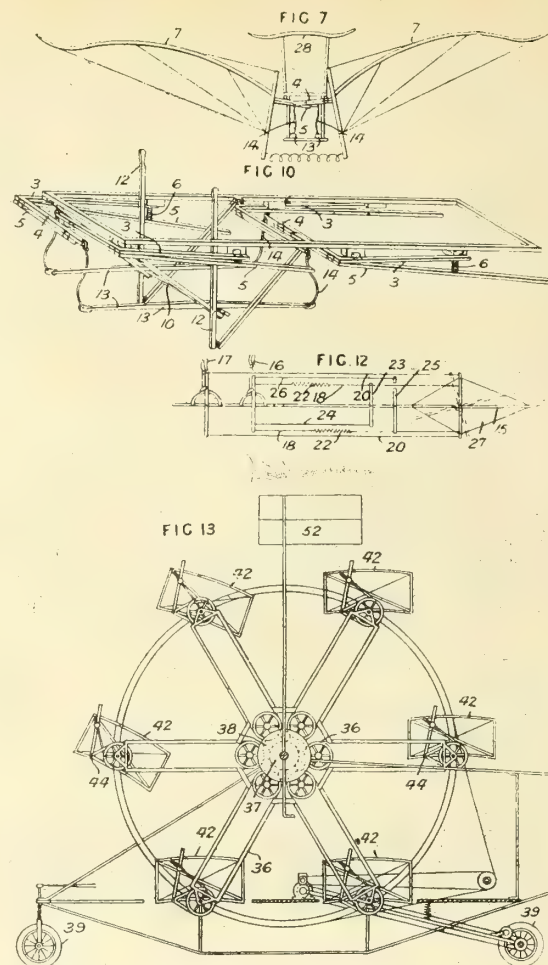
**ABRIDGMENTS OF RECENTLY PUBLISHED SPECIFICATIONS.**

- 110,407. **Aeronautics.** SPRINGER, R. W., 258, Conway Street, Carlisle, Pennsylvania, U.S.A. Oct. 24th, 1916. No. 15102. [Class 4.]

**AERIAL MACHINES WITHOUT AEROSTATS; PLANES, ARRANGEMENT OF; PROPELLING.**—Relates to flying-machines of the kind propelled by rotary propellers or flapping wings arranged so that the blades or wings assume a positive incidence during the up-stroke and a less or negative incidence during the down-stroke. Figs. 7 and 10 show a machine of the flapping-wing type, in which the wings 7 are carried by spars 5 hinged to transverse arms 4 of L-shaped frames 3, which are hinged longitudinally to the machine and are reciprocated by means of links 14 connected to the free ends of the arms 4 and to levers 13, which are rocked about central pivots. There are preferably two sets of wings arranged one behind the other and so that the rear pair inclines upwards rearwardly and the front pair inclines upwards forwardly. Springs 6 press the spars 5 downwards and give the wings a positive incidence during the up-stroke. The spread of the wings may be varied by raising or lowering all the wings together by means of levers 12 adapted to adjust a bar 10 to which the levers 13 are pivoted. A fixed plane or canopy 28, Fig. 7, and an adjustable tail-plane 15, Fig. 12, carrying a vertical fin 27 and arranged to be initially set by a lever 16, are provided. The machine shown in Fig. 13 is supported by a pair of rotary propellers, one at each side of the machine, and each comprising a series of planes or blades 42 arranged to have a limited and spring-controlled movement about pivots 44 near their front ends. The planes are feathered by chain gearing 36, the inner wheels of which engage idler wheels 38 rolling on a fixed central wheel 37. During the up-stroke the planes move about their pivots into a position of positive incidence, as shown at the left-hand side of Fig. 13. The machine is provided with rudders at each side, a central balancing-rudder 52, and an adjustable tail.

**PLANES, CONSTRUCTION OF.**—The transverse camber of the wings is preferably concave downwards at the middle and convex downwards at the edges, and the longitudinal camber is preferably a sine curve. Fig. 2 shows the transverse camber in its simplest form, and Fig. 3 shows that for a pair of flapping wings. The ratio of the longitudinal to the transverse dimensions of the wing is made greater or less according as the machine is intended to fly at higher or lower speeds. The tail 15, Fig. 12, is curved upwardly at the rear.

**STEERING AND BALANCING.**—The tail 15 is initially set according to the speed desired, by means of a lever 16, and is adjusted,

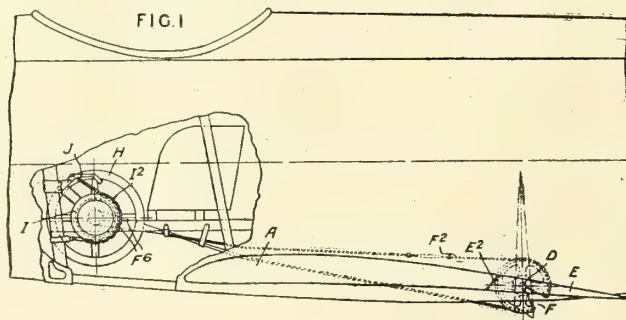


during flight, by a lever 17. The levers 16, 17, are connected to the tail by cords 18, 20 respectively, springs 22 being interposed in the cords 18. A lever 23 is connected at one end to one of the cords 18, and at its other end to the lever 16 by a cord 24. Similarly, another lever 25 is connected at one end to the other cord 18, and at its other end to the lever 16 by a cord 26. The machine shown in Fig. 13 is fitted with a central rudder 52 and also with rudders at each side.

**LAND WHEELS.**—Wheels 39, Fig. 13, are provided on the machine and arranged to be driven by the engine.

- 110,419. **Aeronautics.** SOWWITH AVIATION CO. and SOWWITH, T., Kingston-on-Thames. Nov. 1st, 1916. No. 15618. [Class 4.]

**STOPPING WAY.**—Planes normally forming part of the lifting-surface of an aeroplane are adapted to be turned up into a position at right-angles to the line of flight and locked in that position to reduce the speed on alighting. Fig. 1 shows part of a biplane in which the lower plane A has a section E at each side of the fuselage mounted on a common shaft D. The sec-



tions E normally form a close joint E<sup>2</sup> with the plane A, but can be turned into the position shown in dotted lines by means of a cord F<sup>2</sup> secured to a sector F on the shaft D. The cord F<sup>2</sup> is connected to a chain F<sup>6</sup> passed over a sprocket-wheel adapted to be turned by a hand-wheel H near the pilot's seat. A grooved pulley I on the same shaft is engaged by a leather-link belt I<sup>2</sup> connected by a spring to a lever J which can be turned into a position beyond the dead-centre so that the pulley I is locked by the belt I<sup>2</sup>.



Firth's  
Best Cast Steel  
Files.

Apply for Copy of the  
New Official Price List.

Thos. Firth & Sons, L<sup>d</sup>, Sheffield.

**GWYNNE**  
 LIMITED

CONTRACTORS TO H.M. ADMIRALTY AND WAR OFFICE.

SOLE LICENSEES AND MANUFACTURERS IN THE BRITISH EMPIRE  
 OF THE

"CLERGET" PATENT AERO ENGINES.



WORKS & OFFICES: { CRISP ROAD, HAMMERSMITH, W.6. } LONDON.  
 { CHURCH WHARF, CHISWICK, W.4. }

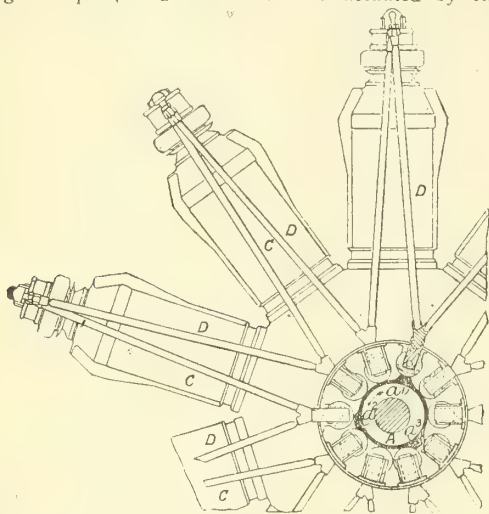
TELEPHONES: 1910 HAMMERSMITH (3 lines).  
 1780 CHISWICK 3 lines).

TELEGRAMS: "GWYNNE, LONDON."



**110,426. Internal-combustion Engines.** HEENAN AND FROUD and RACKHAM, J., Chapel Works, Manchester. Nov. 10th, 1916, No. 16122. [Class 7 (vi).]

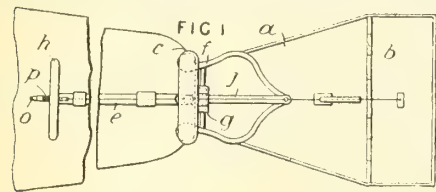
**VALVE-GEAR.**—In a ten-cylinder engine arranged as shown, the pistons of alternate cylinders are connected to a pair of cranks 180 degrees apart, and the valves are actuated by cam-swells



$a^1, a^2, a^3$  on a sleeve A rotating at one-sixth the speed of the crank-shaft. Each tappet-rod actuates the exhaust-valve rod D of one cylinder and the inlet-valve rod C of another cylinder. The order of firing of the cylinders is 1, 8, 5, 2, 9, 6, 3, 10, 7, 4.

**110,454. Aeronautics.** ROBINSON, K. W., The Laurels, Cheam Hill, Worcester Park, Surrey. Jan. 3rd, 1917, No. 112. [Class 4.]

**STEERING.**—Steering-apparatus for aeroplanes and airships comprises a rear surface mounted on a circular base fixed to the

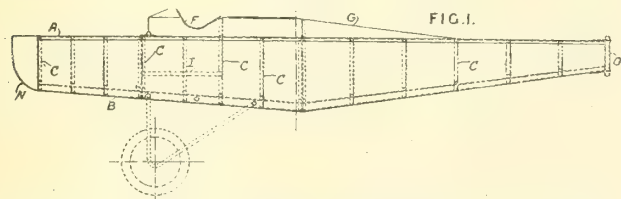


fuselage and adapted to be turned about an horizontal longitudinal axis. The surface has also a hinged rear extremity. Fig. 1 shows in plan a surface  $a$  supported from a ring  $c$  on the fuselage by four

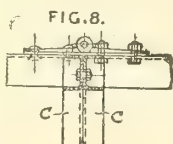
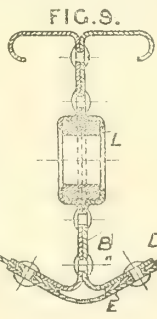
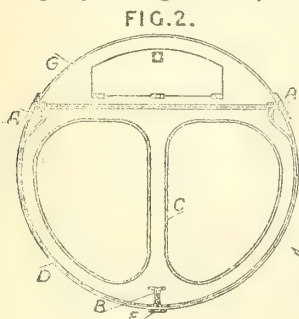
arms  $j$  bearing within a groove in the ring. A shaft  $e$  provided with a wheel  $h$  near the pilot's seat has a pinion  $f$  adapted to engage an internally toothed part  $g$  supported between the arms  $j$  to enable the surface  $a$  to be turned. A hinged part  $b$  on the surface  $a$  is operated by wires led to a chain passing round a wheel  $p$  operated by a lever  $o$ .

**110,433. Aeronautics.** EUGEN, C. M. VON, 71, Middleborough Road, Coventry. May 19th, 1917, No. 161717/16 [Class 4.]

**CARS AND CABINS; FRAMEWORK.**—In a metal fuselage for aeroplanes, etc., of the kind comprising a framework of longitudinal



members connected by transverse stiffening-members, and panels to cover the framework, some of the panels being removable to afford access to the interior, the transverse members consist of flanged plates lightened by holes. In the form shown in Figs.



1 and 2, the framework comprises upper longitudinals A, lower longitudinals B formed of channel-plates riveted back to back, and transverse flanged plates C. Register rings L, Fig. 9, are inserted at intervals in flanged recesses in the lower members B to register the plates for riveting and to relieve the rivets of shear stress. The members C may consist of two flanged plates riveted together. They are riveted by means of cross-strips or plates to the longitudinals A, B. Stiffening-strips E are provided along the bottom where two panels D meet, and are made water-tight in the case of seaplanes. A detachable cowling F and rear fairing G are provided at the top, and longitudinal members I may be inserted to carry controls, etc. A streamline nose-piece N is fitted at the front. Two parts of the framework may be connected by a hinge point, which may be used to allow of folding the parts, but is rendered rigid by the attachment of the panels.

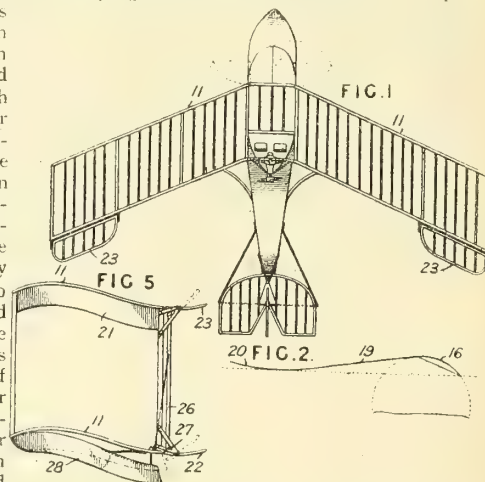
**STEERING; SKID.**—A tubular socket O at the rear end serves for attachment of the fins, rudder, or rear skid.

**PROPELLING.**—The nose-piece N at the front end may form a protection for the magnetos if these are fitted to the front of stationary engines.

**110,472. Aeronautics.** BROOKE, T. P., 6157, St. Laurence Avenue, Chicago, U.S.A. Sept. 14th, 1916, No. 291017. [Class 4.]

**AERIAL MACHINES WITHOUT AEROSTATS; PLANES, CONSTRUCTION AND ARRANGEMENT OF.**—Flying-boats and other aircraft are provided with wings

11 arranged in arrow fashion in plan, Fig. 1, and constructed with parallel upper and lower surfaces having the camber shown in Fig. 2, comprising a circular arc 16 at the front joined by a tangent 19 to a slight upward curve 20 at the rear. The wings are made up of laminations, for example of upper and lower laminae of tough paper, etc., glued



or cemented to intermediate laminae of fabric. Longitudinal fins 21 are provided at the underside of the wings.

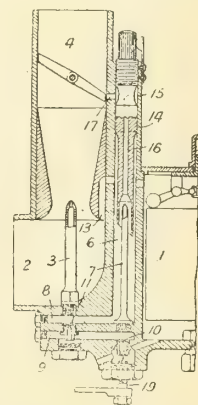
**STEERING AND BALANCING.**—Balanced ailerons 22, 23 are curved as continuations of the camber of the wings and are connected together by rods 26, Fig. 5, and fitted with stops 27 which prevent the rear edges from being depressed below their normal position.

**LAUNCHING AND LANDING.**—Pontoons 28 may be provided at the extremities of the lower wings for alighting on water.

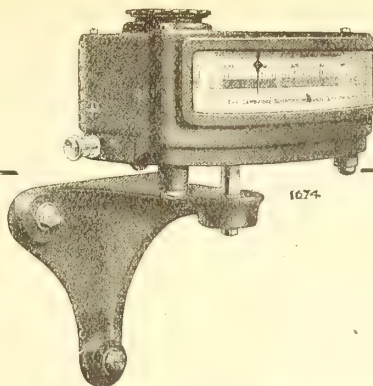
**110,477. Internal-Combustion Engines.** TONDEUR, R., 156, Boulevard Magenta, Paris. March 13th, 1917, No. 3659. [Class 7 (iii).]

**CARBURETTING.**—The carburettor, particularly applicable to automobile and aviation engines, comprises a main nozzle 3 and an auxiliary or slow-running nozzle 7.

The auxiliary nozzle is fed from the float chamber 1 through a restricted orifice 10, and chamber 9, and the main nozzle through restricted orifice 10, chamber 9, restricted orifice 11, and chamber 8. The chamber 8 communicates also with a chamber 6 in which is located the auxiliary nozzle 7 above the discharge orifice of which is a bevelled tubular end of an adjustable rod 14 which is bored axially at 16 to convey mixture to a groove 15 and thence through an orifice 17 to the induction pipe 4. The orifice 10 is adjusted by a needle 19 in accordance with altitude, or regulation may be effected by the rod 14. The lower end of the rod 14 dips into the liquid fuel in the chamber 6 and thus facilitates starting. The chamber 6 communicates with the air inlet passage 2 through a conduit 13 through which, and at times through the nozzle 7, air is drawn to aerate the fuel and keep down the flow thereof at high speeds.







**PORTABLE  
INDICATORS**

with 7" scales.

**WALL - TYPE  
INDICATORS**

with 4½" or 7" scales.

# Cambridge Pyrometers

A REPUTATION OF 37 YEARS IS BEHIND  
EVERY CAMBRIDGE INSTRUMENT.

DESCRIPTIVE LIST NO. 194M SENT FREE ON REQUEST.

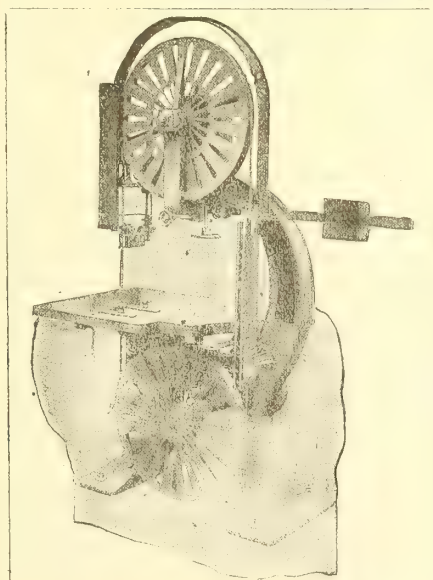
**THE CAMBRIDGE SCIENTIFIC INSTRUMENT CO., Ltd ,  
CAMBRIDGE, ENGLAND.**

Birmingham Office : Daimler House, Paradise Street.

Glasgow Office : Lion Chambers, Hope Street

## HAIGHS (OLDHAM) LIMITED

MANUFACTURERS OF ALL TYPES OF WOOD WORKING MACHINERY.



### C.K.S. Type High Speed Band Sawing Machine

Built in Three Sizes with Saw Pulleys.

26 inches, 30 inches, and 36 inches diameter.

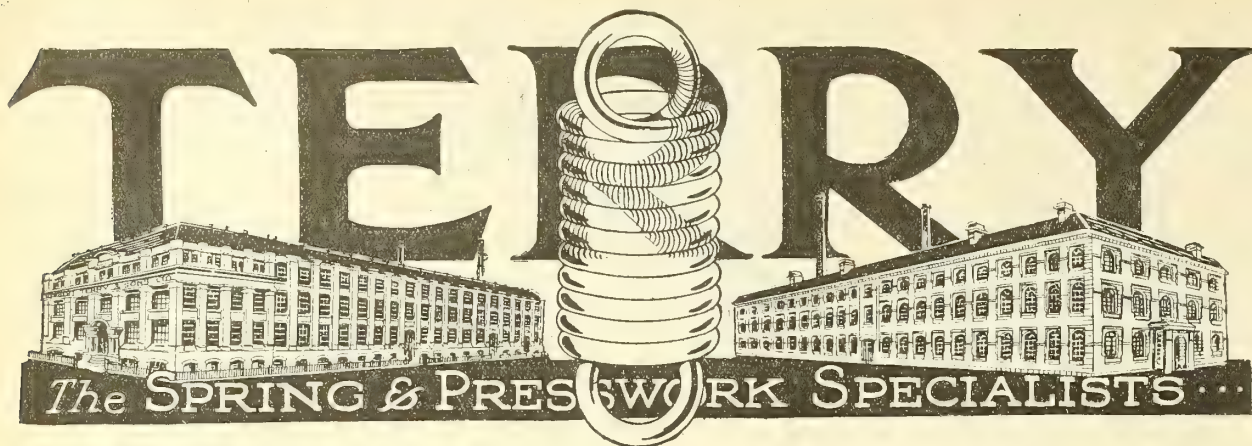
**Globe Iron Works, Oldham.**

Telegrams: HAIGH. OLDHAM.

Telephone: 1273 Oldham.

*Haighs*  
(OLDHAM) LTD.

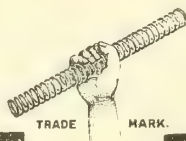
KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



BEHIND a TERRY spring is a name—famed for quality—an organisation of more than 60 specialised departments and capable of meeting any spring needs.

If yours is any branch of war work—write us on the matter—we will quickly tell you if we can assist or not.

HERBERT TERRY & SONS, LTD., The Spring and Presswork Specialists :: :: REDDITCH, ENG.



## The "Guardian Angel" Parachutes



### FROM THE LIST OF CASUALTIES IN THE AEROPLANE OF 21st. NOV., 1917.

CROOKE and RUSSEL—An inquest was held on Nov. 14th on the bodies of Lt. Walter Crooke, R.F.C., aged 18, and Lt. J. H. Russel, R.F.C., aged 27, whose deaths, as the result of a collision, were announced last week.

The evidence showed that four machines were manoeuvring into close formation. Three got into position and Mr. Crooke made a dive to come up with the rest. He apparently did not note that the squadron leader had somewhat altered his course, with the result that his machine struck the fuselage of Mr. Russel's machine, and both fell out of control from a height of 5,000 feet, the two pilots being killed. A verdict of accidental death was returned. Sec. Lt. Walter Crooke, R.F.C., was the son of Mr. and Mrs. Walter Crooke, Priors Lee, Shifnal.

(This is evidently a case in which parachutes might have saved lives.—Ed.)

### WHEN PARLIAMENT ACTS!

In the fullness of time and with a sufficiency of fatal casualties, a Parliamentary Committee will be appointed to enquire into the appalling wastage of our Aviators on the Training Grounds (800 since 1st January, 1917), and the means that may exist for its avoidance or abatement. It will find and report that

## The Indispensable Qualifications of Aerial Life-Saving Apparatus,

#### AS TO THE PARACHUTE, ARE:—

- That it should have automatic (i.e. compellative) opening.
- That it should be under static and kinetic control in all the phases of its action.
- That the rigging should be rendered incapable of entanglement.

#### AS TO THE CONNECTING SLING, ARE:—

- That it should embody an effective shock-absorber.
- That it should not be liable to spin.

#### AS TO THE AVIATOR'S HARNESS, ARE:—

- That it should be instantly releasable on landing.

The "GUARDIAN ANGEL" Parachute, Sling and Harness, is the ONLY Life-Saving Equipment that is able to comply with ANY of the above conditions—and yet it is held to be TOO EXPENSIVE FOR GENERAL USE!

RELIABILITY—First. RELIABILITY—Second. RELIABILITY—ALL THE TIME.

## E. R. CALTHROP'S AERIAL PATENTS, LTD.

ELDON STREET HOUSE, ELDON STREET, LONDON, E.C.2.

Telephones (2 lines): London Wall 3266 and 3267.

Telegraphic and Cable Address: "Savemaliv-Ave-London."

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# THE AIRCRAFT TRADER

## MARKET TOPICS.

(Prices are for quantities on usual terms.)

Dec. 27th, 1917.

**COPPER.**—It is gratifying to note that the output of American producers is reaching a most satisfactory condition; there is, however, still a certain amount of misunderstanding about the price which was fixed by the U.S. Government. It is more than likely that this matter will be satisfactorily settled when the official price comes up for revision next month. There is a possibility that there will be an advance to cover the increased cost of labour and material. At the same time, it is felt in certain quarters that the official price sufficiently covers the recent advances which have been made; if, however, the price is increased, it is more than likely that the authorities here will find it necessary to make an increase.

Conditions here are much the same. Supplies are coming through in a satisfactory manner. This cannot be said of Germany, as it is stated that paper is being used in the manufacture of tubes instead of copper.

There has been an advance here in the price of all tubes, both brass and copper, with the exception of bronzed tubes.

### COMPARATIVE PRICES.

To-day .....	£110 0 0 per ton.
Highest price, 1916	£153 0 0 per ton.
Average price, 1916	£116 1 0 per ton.

**TIN.**—The price of tin still continues to advance. This, of course, is not surprising in view of the high prices in the East, the increased demand, and the lack of shipping statistics. Furthermore, the stocks of tin in America are very low indeed. In fact it is reported that there is only about 1,500 tons in stock, this being equivalent to about one week's supply, the approximate consumption being about 6,000 tons per month. The stocks here, however, are much more satisfactory. The situation in U.S.A. is certainly very acute; in fact, it is reported that the U.S. Navy commandeered 200 tons of tin which was berthed in New York, having been consigned to other consumers.

Although the position on the whole is very obscure, it is difficult to see any prospect of the price becoming easier, seeing that the demands from America will shortly be very large indeed, owing to the shortage of supplies. On the other hand, there is a feeling that the price has reached its maximum.

### COMPARATIVE PRICES.

To-day (22nd) .....	£307 0 0 per ton.
Last month .....	£284 15 0 per ton.
December, 1916 ....	£179 10 0 per ton.
Average price, 1916	£182 3 5 per ton.

**LEAD.**—This market remains unaltered. Supplies are not as satisfactory as they have been, and there is room for considerable improvement.

**STEEL.**—The most important feature of this material is the problem of supplies. There has certainly been a very marked improvement in the production of special aircraft steels, and apparently the Air Board are doing everything humanly possible to meet the colossal demand which will be made upon them during the next few months. The output of the mills is increasing, and they have, apparently, responded loyally to the request for further increased output of steel, and steps are still being made to extend the mills. The hope that supplies of steel might be received from U.S.A. appears to be dead; in some quarters it is said that supplies will not be received until March; this, however, does not appear to be reliable, and it is doubtful if supplies will be forthcoming then. There is, of course, very little, if any, steel going to Russia, and in consequence there will be more material available for Great Britain and her Allies.

High-speed steel is very difficult to get hold of, and seeing that this is of vital importance to aircraft constructors and aero-engine builders, the Air Board would do well to give the matter their prompt attention. It is stated that whereas at one time the shortage was due to inadequate supplies of tungsten, there is now more than sufficient tungsten available, and the position is therefore reversed.

Prices remain unchanged, although there is still the possibility of an advance in the near future.

**TIMBER.**—The question of supplies of silver spruce is, of course, uppermost at present, and although some very fair ship-

ments have recently been received, the country is not yet out of the wood. It is difficult to understand the manner in which the Air Board are handling the question of silver spruce substitutes. One would have thought that timber supplies had given the constructors enough trouble without avoidable difficulties being put in their way.

In the first place, it is stated that no one has been officially advised what silver spruce substitutes have been approved; if some have received official notification, they must be in the minority, as the majority have received nothing official, and the fact that certain A.I.D. inspectors are declining to pass parts made from these woods is sufficient indication that the information is correct. The aircraft constructor could have taught some of our timber experts all they know about wood years ago, and as soon as the timber comes into his possession there is no difficulty whatever in identifying it. Therefore, seeing that everyone must know sooner or later, why not handle the matter in a businesslike manner and officially notify all parties concerned what substitutes have been approved, and in any case surely the A.I.D. should know what they are likely to be called upon to pass.

In the second place, is it the intention of the A.I.D. to insist upon the same high and rigid standard of inspection for substitutes as is usual for silver spruce?

As stated a few weeks ago, the prices of home-grown woods have been fixed, and the regulations and prices as far as they affect aircraft timber buyers are shown elsewhere. Before passing any criticism one would like to see how the regulations work; in one or two instances they do not appear to be very explicit, and it looks as though some of the instructions will bear two or three different interpretations.

Mahogany remains very firm, and shipments have been very light this past two weeks. Plywood is very difficult indeed to procure, and unless steps are taken to ensure good supplies during the next few months a very serious shortage will be threatened.

**FABRICS.**—Another very serious problem is facing the Lish mills—viz., flax supplies. Apparently 75 per cent. of the flax used in Ireland has come from Russia, and the trouble there is likely to affect these supplies.

Presumably the authorities are alive to this problem and are taking steps to overcome any shortage that may arise. It has been suggested on more than one occasion in these columns that cotton fabrics should be used on school machines, and in view of the threatened shortage of flax one cannot understand why this is not done. Furthermore, it is reported that the French Government are using cotton on certain parts of fighting machines, and there is no reason why this cannot be done here. One would naturally expect that when a shortage of one of our most vital materials is threatened, one of the first steps the officials would take would be to conserve the present stocks, and the substitution of cotton for linen where practicable would save a very appreciable quantity of the latter.

There is still the possibility of an advance in price in the New Year, and it is more than likely that there will be an appreciable increase.

## CURRENT PRICES.

Dec. 27th, 1917.

The prices given below are the prices ruling on the above date. TERMS.—Usual for the various materials mentioned.

Prices of old metals are as quoted by scrap dealers.

Prices must not be taken as specific quotations for definite quantities delivered to any part of the country.

### ALUMINIUM.

Ingot .....	£225 per ton.
Remelted .....	£210 per ton.

### BRASS.

Sheets .....	15½d. per lb.
Strip .....	14½d. per lb.
Wire .....	14½d. per lb.
Tubes .....	16d. per lb.
Castings .....	16d. per lb.
Turning Rod .....	14d. per lb.
Brazed Tubes .....	19½d. per lb.



**COPPER.**

Ingot, Standard, Cash	£110 per ton.
Ingot, Standard, 3 mos.	£110 per ton.
Best Selected (Nett)	£123 to £119 per ton.
Sheets	£147 per ton.
Wire	15½d per lb.
Tubes, S.D.	18½d per lb.
Tubes, Brazed	18½d per lb.
Rivets	1s. 10½d per lb., basis.
Tacks	1s. 10d per lb.

**FABRIC.**

Linen, R.A.F., 17C, Spec., 36 in. wide, 2s. 8d. p. yd.	
Linen, R.A.F., 17C, Spec., 38 in. wide, 2s. 9½d. p. yd.	
Spaced, R.A.F., 17C, Spec., 37½ in. wide, 1s. 9d. p. yd.	

**GUN METAL.**

Castings	1s. 8d. per lb.
----------	-----------------

**LEAD.**

Virgin Pig	£29 per ton, c.i.f.
Virgin Pig	£30 per ton, ex stores.
Sheets	£39 10s. per ton, D/d.
Pipes	£40 per ton.
Dry White	£46 10s. per ton, less 5 per cent.
White in Oil	£53 per ton.
White in Oil	£55 per ton.
Red	£42 per ton, less 2½ per cent.

**NICKEL.**

Nickel	£200 per ton.
--------	---------------

**PHOSPHOR BRONZE.**

Ingot, 5 cwt., and under	£156 to £157 per ton.
Castings	1s. 7½d. to 1s. 9½d. per lb.

**PHOSPHOR COPPER.**

Ton lots	£200 to £205 per ton.
----------	-----------------------

**SILVER.**

Silver	43½d. per oz.
--------	---------------

**SOLDER.**

Plumber's	130s.
Tinman's	175s.

**STEEL.\***

High Speed, 14 p. cent., Tungsten, 2s. 10d. per lb., basis.	
High Speed, 18 p. cent., Tungsten, 3s. 10d. per lb., basis.	

**ALLOY STEELS TO AIR BOARD SPECIFICATIONS.****Round and Square:—**

Specification No. S2	£82
Specification No. S2 (bright-drawn)	£115
Specification No. S8	£86
Specification No. S10	£70
Specification No. S12	£75
Specification No. S14	£43
Specification No. S15	£70
Specification No. S16	£70
Specification No. S17	£75
Specification No. S18 (oil-hardened)	£85
Specification No. K1	£75
Specification No. K2	£75
Specification No. K3	£86

The above prices are for ½ in. to 5/16 in. only, other sizes are proportionate

HEXAGONS.	.455 and .525	.601 to .710.
Specification S2	£79	£77
Specification S8	£79	£77
Specification S2 (bright-drawn),	£112	£112
Specification S8 (bright-drawn),	£112	£112

**SPELTER.**

English f.o.b., Birmingham	£57
----------------------------	-----

**TIN.**

Tin	£308
-----	------

**TINPLATES.**

Tinplate	30s., basis, f.c.t.
----------	---------------------

**TIMBER.****\*Official.****Merchants.**

Silver Spruce, 10s. 4d.	18s. 6d., c.f.
Poplar and Cottonwood	15s. to 16s.
Cypress, 10s. 4d.	15s.
English Ash	16s., c.f.
Mahogany, 1s. 6d. to 1s. 10d.—2s. 2d. to 2s. 6d., s.f.	
Walnut, 2s. to 2s. 3d.—2s. 3d. to 2s. 6d. s.f.	

**ZINC.**

Zinc Sheets (American).....£100, f.o.b., New York.

**SCRAP MATERIALS (LONDON PRICES).**

Description. Price per ton on sale at refinery.

Aluminium Sheet cuttings and rods, minimum of 96 per cent. Al.	£160 0 0
Old rolled, etc., containing a minimum of 96 per cent. Al.	120 0 0
Spinnings, punchings, and thin small scrap; also painted and varnished scrap that needs melting, containing a minimum of 96 per cent. Al.	105 0 0
Lump scrap from aero castings and material of equivalent value, containing 87 to 96 per cent. Al.	100 0 0
Turnings and Swarf, generally containing 87 to 95 per cent. Al.	87 10 0
Scrap, generally containing 80 to 86 per cent. Al.	80 0 0
Swarf and inferior Swarf, generally containing 80—85 per cent. Al.	70 0 0
All Scrap, containing below 80 per cent. Al., not to exceed	65 0 0
All Swarf, containing below 80 per cent. Al.	50 0 0
Brass, Heavy Selected	£88
Copper, Clean	100
Copper, Brazery	80
Gun-metal, Scrap	118
Lead, no Draft	26
Zinc, Old	40

\*Official Prices.

†Includes Parcel Inspection only.

‡Prices include Delivery in the U.K.

**DRYING AEROPLANE TIMBER.**

In view of the shortage of thoroughly seasoned ash, mahogany, spruce, walnut, etc., the following extract from the "Mississippi Valley Lumberman" is interesting.

"When the United States entered the war the need for wood to build aeroplanes quickly created a difficult problem. Most of the air-seasoned wood available for aeroplanes had been bought for the Allied nations abroad.

"Thorough air-seasoning requires from one to three years according to the size and kind of wood. Kiln-dried stock under the methods ordinarily used has frequently proved unsatisfactory, and for that reason aeroplane manufacturers have been reluctant to use it. If the needs of the fighting forces were to be met adequately and without delay, it was essential that methods of conditioning should be available in which full confidence could be placed.

"Long before this situation developed the Forest Products Laboratory of the Forest Service at Madison, Wisconsin, had been making a scientific study of the drying of wood, and had developed a method of drying which has been very successful with all the woods tried. Several kilns have been built at the Laboratory for experimental purposes and a number of demonstrations made in commercial kilns. Ash and spruce are the woods most in demand for aeroplane construction, and, anticipating the present situation, the Forest Service secured a shipment of partially air-seasoned ash and spruce for preliminary test. The wood was kiln-dried without injury.

"Thoroughly green Sitka spruce, white ash, white oak, Douglas fir, white pine, and mahogany were secured in log for testing. The spruce and ash logs were cut up, and the green material from each species divided into three matched groups. One group of each species was tested green, another has been set aside to be tested when air-dried, the third group was kiln-dried, several methods being tried, and then tested. Only the results of the spruce tests have so far been analysed. Comparison with standard tests which had already been made shows that Sitka spruce can be kiln-dried from the green condition, with no more, perhaps less, injury to its mechanical properties than by air-seasoning.

"The testing of the ash and other species now on hand, which include several propeller woods, is being pushed on as rapidly as possible, and there seems reason to expect as favourable results as for Sitka spruce."

# PYROMETERS

For Heat Treatment of all parts of  
**Aeroplanes and Aeroplane Engines.**

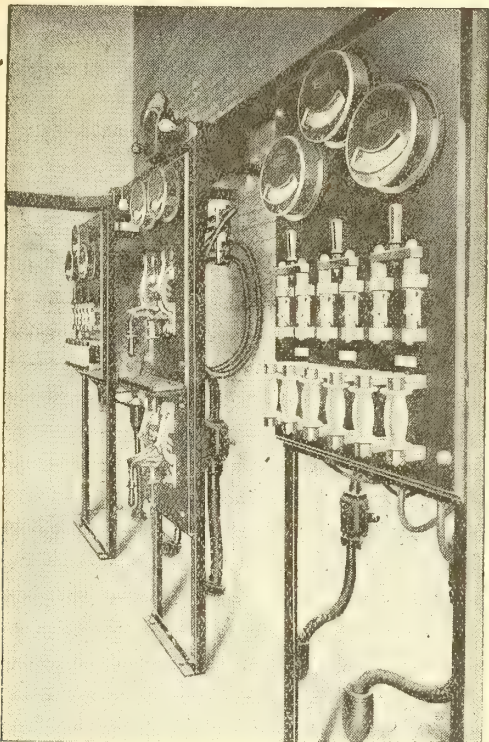
Radiation Pyrometers, catalogue P. 17.

Thermo-couple Pyrometers and Electrical Resistance Thermometers, catalogue P. 19.

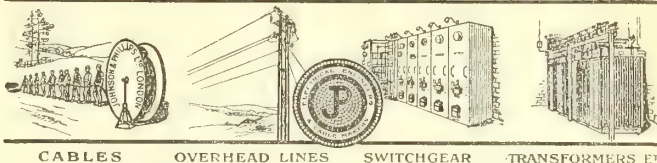
POST FREE ON REQUEST.

**FOSTER INSTRUMENT CO.,**  
LETCWORTH, HERTS, ENG.





SPECIALISTS IN ELECTRICAL TRANSMISSION AND DISTRIBUTION



*The Illustration shows a Low-tension Alternating Current*

## WORKS DISTRIBUTION BOARD

*lately installed by us to control the supply of Power to Motors, Lights, etc., in a well-known Aeroplane Factory.*

*All Cabling, etc., carried out by us.*

12, UNION COURT, OLD BROAD ST., LONDON, E. C. 2.

Telegrams  
"JUNO"  
LONDON

**JOHNSON AND PHILLIPS LTD**  
ELECTRICAL ENGINEERS & CABLE MAKERS  
CHARLTON, LONDON, S.E. 7.

Telephone  
400  
GREENWICH

BIRMINGHAM CARDIFF GLASGOW MANCHESTER NEWCASTLE-ON-TYNE PORTSMOUTH  
208, Corporation St. 9 Park Place, 150 W. George St. 251, Deansgate 44b, Blackett St. Cleveland Rd. Gosport

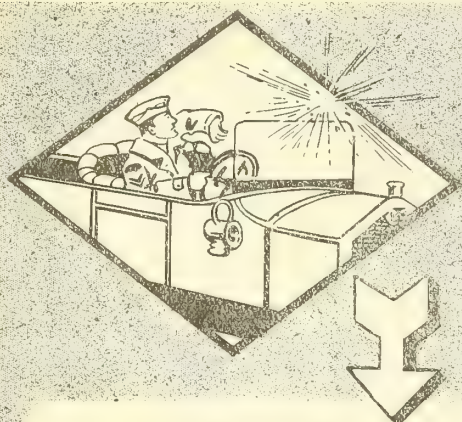
TELEGRAMS "AVIATION" NORWICH.

PHONE NO 881 NORWICH



# AIRCRAFT WORKS NORWICH

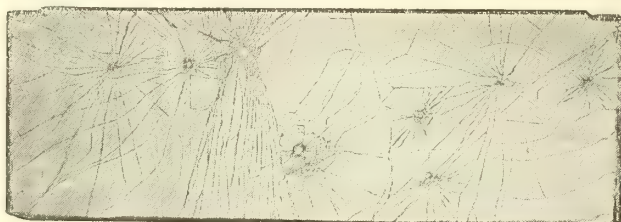




# 'TRIPLEX'

## THE ONLY SAFETY GLASS

An Auster TRIPLEX Windscreen on a Crossley Car attached to the Royal Flying Corps. A shrapnel shell exploded fairly close to the car and it will be noticed that the glass in question was struck by eight shrapnel bullets, and yet only one penetrated the glass, and that one only just got through. The glass is still perfectly rigid and strong, airtight and watertight, and, except for one small hole, sufficiently strong to continue its work for an indefinite period.



It is Essential for  
Goggles,  
Windscreens,  
Windows, etc.

Send for Literature  
Mailed Post Free.

The Triplex Safety Glass  
Co., Ltd.,  
1 Albemarle St., London, W.1.

Telephone: Regent 1840.  
Telegram: Shatterly's, Piccy, London

CONTRACTORS TO  
H.M. GOVERNMENT

"On Wave and Wing."

## Beardmore Aero Engine

The Finest Specimen of British  
WORKMANSHIP.

THE BEARDMORE AERO ENGINE, LIMITED,  
London Showrooms and Depots:  
112, GT. PORTLAND STREET, LONDON; W.1.  
Telephone: Gerrard 238.

C.D.C.



## THE R.N.A.S. HONOURS LIST FOR 1917.

(Continued from page 28).

**The Distinguished Service Medal (continued).**

Flt. Comdr. A. Q. COOPER, R.N.A.S.  
 Flt. Comdr. J. S. WHEELWRIGHT, R.N.A.S.  
 Flt. Comdr. J. G. STRUTHERS, R.N.A.S.  
 Flt. Comdr. C. MACLAURIN, R.N.A.S.  
 Flt. Lt. J. A. CARR, R.N.A.S.  
 Flt. Lt. J. W. WALKER, R.N.A.S.  
 Flt. Lt. C. S. COLTSON, R.N.  
 Flt. Lt. J. F. DIXON, R.N.A.S.  
 Flt. Lt. A. S. ELLIOTT, R.N.A.S.  
 Flt. Sub-Lt. T. G. C. WOOD, R.N.A.S.  
 Flt. Sub-Lt. W. J. DE SALIS, R.N.A.S.  
 Flt. Sub-Lt. A. L. SIMS, R.N.A.S.  
 Flt. Sub-Lt. H. M. MORRIS, R.N.A.S.  
 (EASTERN MEDITERRANEAN).  
 Sqdn. Comdr. H. STANLEY-ADAMS, R.N.A.S.

Nov. 2nd.

Flt. Comdr. HAROLD AUSTEN BUSS, R.N.A.S.  
 Actg. Flt. Comdr. STEARNE TIGHE EDWARDS, R.N.A.S.  
 Actg. Flt. Comdr. HOWARD JOHN THOMAS SAINT, R.N.A.S.  
 Flt. Lt. HAROLD SEENCER KERBY, R.N.A.S.  
 Flt. Lt. JOHN FLEMING JONES, R.N.A.S.  
 Flt. Lt. ARTHUR FRANK BRANDON, R.N.A.S. (since killed).  
 Flt. Lt. RONALD ROSCOE THORNLEY, R.N.A.S.  
 Actg. Flt. Lt. RICHARD PEARMAN MINIFIE, R.N.A.S.  
 Actg. Flt. Lt. (now Flt. Lt.) ARTHUR ROY BROWN, R.N.A.S.  
 Actg. Flt. Lt. (now Flt. Lt.) DESMOND FITZGERALD FITZGIBBON, R.N.A.S.  
 Flt. Sub-Lt. CHARLES BEVERLEY SPROATT, R.N.A.S.  
 Flt. Sub-Lt. LEONARD WILLIAM ORMEROD, R.N.A.S.  
 Flt. Sub-Lt. JOHN SOUTHEY WIGHT, R.N.A.S.  
 Flt. Sub-Lt. WILLIAM ALLAN SCOTT, R.N.A.S.  
 Obsr. Sub-Lt. PAUL BEWSTER, R.N.A.S.

FOR SERVICE AGAINST SUBMARINES.

Flt. Lt. T. H. NEWTON, R.N.A.S.

Nov. 17th.

Flt. Comdr. G. E. HERVEY, R.N.A.S.  
 Actg. Flt. Comdr. H. G. HOLDEN, R.N.A.S.  
 Flt. Sub-Lt. (now Flt. Lt.) V. R. GIBBS, R.N.A.S.  
 Flt. Sub-Lt. (now Flt. Lt.) L. H. SLATTER, R.N.A.S.  
 Flt. Sub-Lt. S. W. ROSEVEAR, R.N.A.S.  
 Flt. Sub-Lt. F. R. JOHNSON, R.N.A.S.

FOR SERVICE AGAINST SUBMARINES.

Flt. Sub-Lt. C. S. MOSSOP, R.N.A.S.

Nov. 30th.

Actg. Flt. Comdr. F. C. ARMSTRONG, R.N.A.S.  
 Flt. Lt. H. F. BEAMISH, R.N.A.S.  
 Flt. Sub-Lt. (now Flt. Lt.) E. T. HAYNE, R.N.A.S.  
 Flt. Sub-Lt. G. W. HEMMING, R.N.A.S.  
 Flt. Sub-Lt. J. E. L. HUNTER, R.N.A.S.

Dec. 19th.

Flt. Lt. R. G. GARDNER, R.N.A.S.  
 Flt. Lt. J. W. ALCOCK, R.N.A.S. (now prisoner).  
 Flt. Sub-Lt. (now Flt. Lt.) C. F. M. CHAMBERS, R.N.A.S.  
 Flt. Sub-Lt. (actg. Flt. Lt.) W. A. CURTIS, R.N.A.S.  
 Obsr. Lt. C. CHAPMAN, R.N.A.S.  
 Flt. Sub-Lt. C. R. LUPTON, R.N.A.S.  
 Flt. Sub-Lt. E. DICKSON, R.N.A.S.  
 Obsr. Sub-Lt. W. L. HILL, R.N.A.S.  
 Flt. Sub-Lt. J. G. MANUEL, R.N.A.S.  
 Obsr. Sub-Lt. T. TERRELL, R.N.A.S.

FOR SERVICE AGAINST SUBMARINES.

Flt. Sub-Lt. (now Flt. Lt.) N. A. MAGOR, R.N.A.S.

Flt. Sub-Lt. R. JARMAN, R.N.A.S.

**A Bar to the Distinguished Service Cross.**

Feb. 16th, 1917.

Flt. Lt. DANIEL MURRAY BOYNE GALBRAITH, D.S.C., R.N.A.S.

May 12th.

Flt. Lt. RONALD GRAHAME, D.S.C., R.N.A.S.

June 22nd.

Flt. Comdr. THEODORE DOUGLAS HALLAM, D.S.C., R.N.A.S.  
 Flt. Comdr. RODERIC STANLEY DALLAS, D.S.C., R.N.A.S.  
 Flt. Lt. CHARLES LANGSTON SCOTT, D.S.C., R.N.A.S.  
 Flt. Lt. ROBERT ALEXANDER LITTLE, D.S.C., R.N.A.S.

Aug. 11th.

Flt. Comdr. ROBERT JOHN ORTON COMPSTON, D.S.C., R.N.A.S.  
 Flt. Lt. JOHN EDWARD SHARMAN, D.S.C., R.N.A.S.

FOR SERVICE AGAINST SUBMARINES.

Flt. Sub-Lt. R. F. L. DICKEY, D.S.C., R.N.A.S.

Aug. 29th.

Flt. Comdr. THOMAS FREDERICK LE MESURIER, D.S.C., R.N.A.S.

Sept. 14th.

FOR SERVICE AGAINST SUBMARINES.

Flt. Comdr. IRWIN NAPIER COLIN CLARKE, D.S.C., R.N.A.S.

Flt. Lt. WARREN RAWSON MACKENZIE, D.S.C., R.N.A.S.

Oct. 1st.

(PATROL DUTIES AND SUBMARINE SEARCHING).

Sqdn. Comdr. F. J. RUTLAND, D.S.C., R.N.A.S.

Nov. 30th.

Actg. Flt. Comdr. R. P. MINIFIE, D.S.C., R.N.A.S.

FOR SERVICE AGAINST SUBMARINES.

Flt. Lt. B. D. HOBBS, D.S.O., D.S.C., R.N.A.S.

Dec. 19th.

Flt. Lt. (actg. Flt. Comdr.) J. S. T. FALL, D.S.C., R.N.A.S.  
 Flt. Lt. H. T. MELLINGS, D.S.C., R.N.A.S.

FOR SERVICE AGAINST SUBMARINES.

Flt. Lt. E. J. CUCKNEY, D.S.C., R.N.A.S.

**A Second Bar to Distinguished Service Cross.**

Nov. 30th.

FOR SERVICE AGAINST SUBMARINES.

Flt. Sub-Lt. (now Flt. Lt.) F. L. DICKEY, D.S.C., R.N.A.S.

Dec. 19th.

FOR SERVICE AGAINST SUBMARINES.

Flt. Comdr. T. D. HALLAM, D.S.C., R.N.A.S.

\* \* \*

Flt. Lt. (actg. Flt. Comdr.) J. S. T. FALL, D.S.C., R.N.A.S.

**THE DISTINGUISHED SERVICE MEDAL.**

Feb. 16th.

Air Mech. Ernest W. Nelson, O.N. F25205.

April 19th.

Actg. Air Mech., 1st Gr., Walter Bunce, O.N. F7088.

May 12th.

P.O. Mech. Walter Laurence, O.N. 300142; P.O. Mech. Frederick Henry Winstone, O.N. F570; C.P.O. Mech., 3rd Gr., George Frederick Ridgeway Marden, O.N. F4718; P.O. Mech. William Stephen Burville, O.N. F4117; C.P.O. Mech., 1st Gr., Charles Harold Potts, O.N. M1008; C.P.O. Mech., 3rd Gr., Herbert Ernest Phillp, O.N. F6491; Ldg. Mech. John McCredie, O.N. F148; P.O. Mech. Edward William Dawson, O.N. F1748; P.O. Mech. Alexander Bell, O.N. F2422; Ldg. Mech. Charles Thomas, O.N. F2350; C.P.O. Mech., 1st Gr., Henry Herbert Smith Scott, O.N. 345608; C.P.O. Mech., 3rd Gr., John Archibald Rosling, O.N. F81; P.O. Mech. Frederick Thomas McSorley, O.N. F1223; C.P.O. Mech., 3rd Gr., Bert Arvoy, O.N. F672; P.O. Mech. Ferdinand Fantini, O.N. F2489; Ldg. Mech. William Frederick Cliffe, O.N. F6074; P.O. Mech. Samuel Percy Finch, O.N. F599; P.O. Mech. William Ernest Watson, O.N. F593; Air Mech., 1st Gr., Robert George Kimberley, O.N. F4766.

June 15th.

C.P.O. (C) J. Noonan, R.N.A.S., O.N. M2345 (Po.); Air Mech., 1st Gr., F. Wilmshurst, R.N.A.S., J29563 (Po.).

June 22nd.

Actg. Air Mech., 1st Cl., F. Bate, O.N. F13351; Air Mech., 2nd Cl., A. G. Flowers, O.N. F19901; P.O. Mech., 3rd Cl., J. W. Rose, O.N. J2348 (Dev.); Air Mech., 1st Cl., G. B. Clements, O.N. F9008; Air Mech., 2nd Cl., J. R. Laycock, O.N. F9281; C.P.O., 3rd Cl., V. F. Whatling, O.N. 238581 (Ch.); Air Mech., 1st Cl., D. G. Rennett, O.N. F9088; Air Mech., 2nd Cl., C. S. Laycock, O.N. F10364; E.R.A., 2nd Cl., A. M. Langley, O.N. 270895 (Po.); Air Mech., 2nd Cl., W. P. Caston, O.N. F4177; Air Mech., 1st Cl., A. E. Shorter, O.N. F7380.

July 13th.

OPERATIONS IN EAST AFRICA.

P.O. Mech. Chas. Ernest Cobb, R.N.A.S.; P.O. Mech. Donald McLean Graham, R.N.A.S.

July 20th.

C.P.O. Mech., 3rd Gr., Frederick Cusden, O.N. F5011 (Po.); Air Mech., 2nd Cl., Henry Martineau Davis, O.N. F20254; Air Mech., 1st Cl., Arthur William Goody, O.N. F12237.

FOR SERVICE AGAINST SUBMARINES.

Air Mech., 2nd Gr., D. R. Chapman, O.N. F13487.

Aug. 11th.

Jnr. Res. Attdt. S. Rothwell, R.N.A.S.B.R., O.N. M15814 (Po.).

Ldg. A.C., T. Busby, O.N. F18555; A.C., 1st Gr., J. H. Daw, O.N. F12687; A.C., 2nd Gr., C. A. Millhouse, O.N. F22637; Air Mech., 2nd Gr., F. Anderson, O.N. F7380; Air Mech., 1st Gr., T. Caird, O.N. F6181; P.O. Mech. (E.) H. Dixon, O.N. F4542.

FOR SERVICE AGAINST SUBMARINES.

Air Mech., 1st Gr., J. Watts, O.N. F4923; Actg. Air Mech., 1st Gr., E. E. Hughes, O.N. F7223.

Aug. 29th.

A.C., 2nd Gr., L. N. Saw, O.N. F16741; Actg. Air Mech., 1st Gr., J. McKimmie Young, O.N. F3652; Air Mech., 1st Gr., P. J. Adkins, O.N. F2763; Air Mech., 1st Gr., F. J. George.

## THE R.N.A.S. HONOURS LIST FOR 1917.

## The Distinguished Service Medal (continued).

O.N. F1947; C.P.O. Mech., 2nd Gr., J. L. Adams, O.N. F348; Ldg. Mech. B. Cromack, O.N. F9156.

Sept. 14th.

Air Mech., 1st Gr., Edward Darby, O.N. F849; Air Mech., 1st Gr., William David Sambrooke, O.N. F6630.

## FOR SERVICE AGAINST SUBMARINES.

Air Mech., 1st Gr., Henry Leslie Curtis, O.N. F24994; Air Mech., 2nd Gr., William Henry Grey, O.N. F6068.

Oct. 1st.

## PATROL DUTIES AND SUBMARINE SEARCHING.

Air Mech., 1st Gr., J. M. Quail, O.N. F8381; Ldg. Sea. H. G. Cook, O.N. 230789 (Po.) (now Warrrt. Officer, 2nd Gr.); E.R.A., 3rd Cl., W. F. Shaw, O.N. 271948 (Po.); Air Mech., 1st Gr., A. J. Redman O.N. F7470; Air Mech., 2nd Gr., W. R. Liddiard, O.N. F13497; C.P.O. Mech., 3rd Gr. (E), J. G. Cockburn, O.N. F8627; Air Mech., 1st Gr. (E), E. McCormack, O.N. F8678; A.C., 2nd Gr., D. A. Thomas, O.N. F17436; Air Mech., 1st Gr., C. Harrison, O.N. F9484; P.O. Mech. E. E. Turner, O.N. F364; C.P.O. N. B. Holmes, R.N.R., O.N. 302 WTS.; Ldg. Mech. T. B. Thompson, O.N. J13350; Air Mech., 1st Gr., W. Fairnie, O.N. F11069; P.O. Mech. H. Say, O.N. F3212; C.P.O. Mech., 3rd Gr., G. Jarrett, O.N. F2588; C.P.O. Mech., 2nd Gr., J. Smith, O.N. F4200; C.P.O. Mech., 3rd Gr., J. M. Beard, O.N. F618; Air Mech., 2nd Gr., G. L. Wright, O.N. F9666; Air Mech., 2nd Gr., H. M. Lewis, O.N. F8525; Air Mech., 2nd Gr., D. A. Alderton, O.N. F13047; Air Mech., 2nd Gr., C. Turl, O.N. F9807; C.P.O. Mech., 2nd Gr., W. E. Bradley, O.N. F3646; Actg. Air Mech., 1st Gr., H. D. Gregory, O.N., F8820; W.T.Op. A. K. Wise, R.N.R., O.N., 389 WTS.; Actg. Air Mech., 1st Gr., C. M. M. McCarthy, O.N. F13474; Air Mech., 2nd Gr., J. White, O.N. F3669; Ldg. Mech. G. H. Daly, O.N. F5120; P.O. Mech. C. P. Litchfield, O.N. F3630; Ldg. Mech. T. N. Bore, O.N. F3616; Air Mech., 2nd Gr., S. A. Jefferies, O.N. F5783; Ldg. Air Mech. N. H. Jenkins, O.N. F3663 (now Prob. Obsr. Officer, R.N.A.S.).

## EASTERN MEDITERRANEAN.

C.P.O. Mech., 3rd Gr., A. P. Marchant, O.N. 232250 (Ch.) (now Warrrt. Officer, 2nd Gr.); Air Mech., 1st Gr. (C), H. M. Green, O.N. F7728; Air Mech., 1st Gr., A. Carder, O.N. F2290; Air Mech., 1st Gr., A. E. King, O.N. F4373; C.P.O. Mech., 1st Gr., H. Earll, O.N. 340416 (Ch.); P.O. Mech. W. Smith, O.N. F2096; Air Mech., 1st Gr. (E), H. W. Wright, O.N. F2449; Air Mech., 1st Gr., W. E. Jones, O.N. 217874 (R.F.A., Ch/B5242) (prisoners of war).

Nov. 2nd.

Ldg. Mech. R. W. Bager, O.N. F2176; Actg. Air Mech., 1st Gr., H. G. Lovelock, O.N. J26402 (Po.); P.O. Mech. B. Hinckler, O.N. F311 (Ch.).

## FOR SERVICE AGAINST SUBMARINES.

Actg. Air Mech., 1st Gr., William Norman Blacklock, O.N. F4157.

Nov. 7th.

Air Mech., 1st Gr., T. R. Barber, O.N. F3771; Air Mech., 1st Gr., L. G. S. Boshier, O.N. 15936 (Po.); A.C., 1st Cl., G. Conley, O.N. F16254; Actg. Air Mech., 1st Gr., C. Spikins, O.N. F8732.

Nov. 30th.

## FOR SERVICE AGAINST SUBMARINES.

Air Mech., 1st Gr., J. A. Mortimer, O.N. F11344; Air Mech., 2nd Gr., E. M. Nicol, O.N. F18942.

Dec. 19th.

## FOR SERVICES AGAINST ENEMY SUBMARINES.

Actg. Air Mech., 1st Gr., E. H. Clarke, O.N. F17921.

\* \* \*

Ldg. Mech. S. H. Pinchen, O.N. F2932.

Actg. Air Mech., 1st Gr., G. Smith, O.N. F4430.

## A Bar to the Distinguished Service Medal.

Oct. 1st.

C.P.O. Mech., 2nd Gr., John Frederick Tadman, O.N. 271984.

## The Conspicuous Gallantry Medal.

July 20th.

C.P.O. Mech., 2nd Gr., John Frederick Tadman, O.N. 271984.

For conspicuous gallantry in climbing out on the wing of an aeroplane to plug a leak in the radiator. He remained in this position for a period of 20 minutes, thus enabling the aeroplane to return safely to her base.

## THE ALBERT MEDAL.

Dec. 14th.

The King has been pleased to award the Albert Medal in Gold to Nicholas Rath, seaman, R.N.R., and the Albert Medal to Richard Knoulton, ordinary seaman, R.N., and George Faucett Pitts Abbott, deckhand, R.N.R., trawler section, in recognition of their gallantry in saving life in the following circumstances:—

On Sept. 14th, 1917, a seaplane came into collision with one of the masts of a shore wireless station, and remained wedged in it, the pilot (Actg. Flt. Comdr. E. A. de Ville) being rendered unconscious, and thrown out of his seat onto one of the wings.

The three men above mentioned at once climbed up the mast for 100 feet, when Rath, making use of the boatswain's chair, which moves on the inside of the mast, was hoisted up by men at the foot of the mast to the place, over 300 feet from the ground, where the seaplane was fixed. He then climbed out on the plane, and held the pilot until the arrival of Knoulton and Abbott, who passed the masthead gantline out to him.

Having secured the pilot with the gantline Rath, with the assistance of Knoulton and Abbott, lifted him from the plane to the inside of the mast, and lowered him to the ground.

The three men were very well aware of the damaged and insecure condition of the mast, which was bent to an angle where the seaplane had become wedged. One of the three supports of the mast was fractured, and, so far as the men knew, the mast or seaplane might at any time have collapsed.

Dec. 18th.

The King has been pleased to confer the Albert Medal on Flt. Lt. Edward Peverall Meggs Davis, R.N.A.S. The following is the account of the services in respect of which the decoration has been conferred:—

On Oct. 3rd, 1917, whilst carrying out a practice flight, a seaplane, piloted by Flt. Sub-Lt. James Douglas Grant, fell into the sea. The seaplane turned over and the pilot was enclosed in the boat under water. Flt. Lt. Edward Peverall Meggs Davis immediately flew a seaplane to the position of the accident, made fast to the wreck, and dived under the wreck in his uniform and endeavoured to extricate Flt. Sub-Lt. Grant.

To do this it was necessary for him to dive amongst, and struggle through, the mass of wires and broken parts of the wreck. Notwithstanding the imminent danger of being caught up amongst them, Lt. Davis continued his efforts to get Flt. Sub-Lt. Grant out, until the emergency boat arrived on the scene. No other help was at hand until the arrival of this motor-boat, which at the time of the accident was about a mile and a half away.

Flt. Lt. Davis risked his life in endeavouring to save that of his brother officer, as there was every chance of his becoming caught under water in the wires of the wreck.

[Accounts of this incident vary considerably.—Ed.]

## FOREIGN ORDERS.

The following Decorations have been conferred by the Allied Powers on Officers of the British Naval Force for distinguished services rendered during the war:—

## CONFERRED BY THE PRESIDENT OF THE FRENCH REPUBLIC.

## CROIX DE GUERRE.

March 23rd.

Comdr. HENRY C. HALAHAN, D.S.O., R.N.  
Wing Comdr. RICHARD B. DAVIES, V.C., D.S.O., R.N.  
Sqdn. Comdr. FRANCIS K. HASKINS, D.S.C., R.N.  
Lt. DENYS C. G. SHOPPEE, D.S.C., R.N.  
Lt. Viscount MAIDSTONE, R.N.V.R.

## LEGION OF HONOUR.

April 10th.

## OFFICER.

Capt. WILLIAM L. ELDER, R.N. (Wing Capt., R.N.A.S.).

## CHEVALIER.

Wing Comdr. RICHARD B. DAVIES, V.C., D.S.O., R.N.

## CROIX DE GUERRE.

Flt. Sub-Lt. HORACE E. P. WIGGLESWORTH, R.N.A.S.

Flt. Sub-Lt. FRED C. ARMSTRONG, R.N.A.S.

Flt. Sub-Lt. RONALD F. REDPATH, R.N.A.S.

Flt. Sub-Lt. PERCY G. McNEIL, R.N.A.S.

Flt. Sub-Lt. RAYMOND COLLISHAW, R.N.A.S.

Air Mech., 1st Cl. SYDNEY HERBERT PINCHEN, O.N. F2932.

## CROIX DE GUERRE.

July 20th.

Flt. Comdr. JOHN D. NEWBERRY, R.N.A.S.

Flt. Comdr. FRANK FOWLER, D.S.C., R.N.A.S.

Flt. Comdr. CHARLES C. R. EDWARDS, D.S.C., R.N.A.S.

Flt. Comdr. CHARLES D. BOOKER, D.S.C., R.N.A.S.

Flt. Comdr. ALEXANDER M. SHOOK, R.N.A.S.

Actg. Flt. Comdr. HENRY G. OLDEN, R.N.A.S.

Flt. Lt. GEORGE G. MACLENNAN, R.N.A.S.

Obsr. Lt. ERIC B. C. BETTS, R.N.A.S.

Flt. Lt. ROBERT A. LITTLE, D.S.C., R.N.A.S.

Flt. Lt. JOHN E. SHARMAN, D.S.C., R.N.A.S.

Lt. HECTOR A. FURNESS, R.N.V.R.

Lt. RUSSELL W. GOW, D.S.C., R.N.V.R.

Flt. Sub-Lt. JAMES A. GLEN, R.N.A.S.

Flt. Sub-Lt. WALTER E. FLETT, D.S.C., R.N.A.S.

Obsr. Sub-Lt. CHARLES K. CHASE, D.S.C., R.N.A.S.

## LEGION OF HONOUR.

Aug. 11th.

## COMMANDER.

Capt. G. M. PAINE, C.B., M.V.O., R.N., Commodore, 1st Cl.



## THE R.N.A.S. HONOURS LIST FOR 1917.

## Foreign Orders and Decorations (continued).

LEGION D'HONNEUR.

CROIX D'OFFICIER.

Capt. A. V. VYVYAN, D.S.O., R.N.

Wing Capt. R. M. GROVES, D.S.O., R.N.

Wing Comdr. I. T. COURTNEY, R.N.A.S. (Capt. and Temp. Lt.-Col., R.M.L.I.).

CROIX DE GUERRE.

Flt. Lt. WILLIAM E. ROBINSON, R.N.A.S.

LEGION D'HONNEUR.

CROIX D'OFFICIER.

Capt. CHARLES L. LAMBE, D.S.O., R.N.

Comdr. HENRY C. HALAHAN, D.S.O., R.N.

CHEVALIER.

Sqn. Comdr. FRANCIS K. HASKINS, D.S.C., R.N.

Sqn. Comdr. DOUGLAS C. S. EVILL, D.S.C., R.N.

Sqn. Comdr. REDFORD H. MULOCK, D.S.O., R.N.A.S.

LEGION D'HONNEUR.

CROIX DE CHEVALIER.

Wing Comdr. CHRISTOPHER L. COURTNEY, R.N.

Sqn. Comdr. B. L. HUSKISSON, D.S.O., R.N.A.S.

CROIX DE GUERRE.

Flt. Lt. (Actg. Flt. Comdr.) R. GRAHAM, D.S.C., R.N.A.S.

Flt. Lt. BASIL E. P. GREGG, R.N.A.S.

LEGION D'HONNEUR.

CROIX D'OFFICIER.

Capt. H. D. BRIGGS, R.N. (Wing Capt., R.N.A.S.).

CROIX DE GUERRE.

Flt. Lt. B. A. SMART, D.S.O., R.N.A.S.

## CONFERRED BY THE KING OF ITALY.

ORDER OF THE CROWN OF ITALY.  
OFFICER.

Wing Comdr. IVOR T. COURTNEY, R.N.A.S., Capt. and Temp. Lt.-Col., R.M.L.I.).

ORDER OF ST. MAURICE AND ST. LAZARUS.  
OFFICER.

Comdr. C. R. DANE, R.N. (Wing Comdr., R.N.A.S.).

CAVALIER.

Flt. Comdr. D. HARRIES, R.N.

Flt. Comdr. D. W. A. BARTON, R.N.A.S.

Flt. Comdr. F. W. LUCAS, R.N.A.S.

ORDER OF THE CROWN OF ITALY.  
OFFICER.

Comdr. H. L. WOODCOCK, R.N. (Wing Comdr., R.N.A.S.).

CAVALIER.

Flt. Lt. R. F. E. WICKHAM, R.N.A.S.

Flt. Lt. R. F. MAITLAND, R.N.A.S.

BRONZE MEDAL FOR MILITARY VALOUR.

Flt. Comdr. A. Q. COOPER, R.N.A.S.

## CONFERRED BY THE KING OF THE BELGIANS.

ORDER OF LEOPOLD.  
CHEVALIER.

Actg. Flt. Comdr. CHARLES C. R. EDWARDS, R.N.A.S.

CROIX DE GUERRE.

Actg. Flt. Comdr. C. D. BOOKER, R.N.A.S. (for work with British Army).

ORDER OF LEOPOLD.  
OFFICER.

Capt. CHARLES L. LAMBE, D.S.O., R.N.

CHEVALIER.

Wing Comdr. SPENSER D. A. GREY, D.S.O., R.N.

Sqn. Comdr. EDWARD T. NEWTON-CLARE, D.S.O., R.N.A.S.

ORDER OF LEOPOLD.  
CHEVALIER.

Flt. Comdr. SIDNEY V. SIPPÉ, D.S.O., R.N.A.S.

ORDER OF THE CROWN.  
CHEVALIER.

Sqn. Comdr. REGINALD L. G. MARIX, D.S.O., R.N.A.S.

Sqn. Comdr. JOHN P. WILSON, D.S.C., R.N.A.S.

Flt. Comdr. JOHN S. MILLS, D.S.C., R.N.A.S.

Flt. Lt. RALPH H. COLLETT, D.S.C., R.N.A.S.

MEDAILLE MILITAIRE.

133 2nd Gr. C.P.O. E., A. H. SIMMONDS, R.N.A.S.

## CONFERRED BY THE KING OF ROUMANIA.

ORDER OF MIHAI VITEAZUL.

THIRD CLASS.

Flt. Lt. ARTHUR F. F. JACOB, R.N.A.S.

## CONFERRED BY THE EMPEROR OF JAPAN.

ORDER OF THE RISING SUN.—3RD CLASS.

Capt. MURRAY F. SUETER, C.B., R.N. (Commodore, 1st Cl.).

## SPECIAL PROMOTIONS.

SPECIAL APPOINTMENT.

The King has been pleased, by Letters Patent under the Great Seal, bearing date January 11th, 1917, to appoint:—

Captain (Commodore 1st Cl.) GODFREY MARSHALL PAINE, C.B., M.V.O., to be Commissioner for executing the Office of Lord High Admiral of the United Kingdom of Great Britain and Ireland, etc.

Sqn. Comdr.—E. F. Briggs, D.S.O., promoted to Wing Comdr., seny. Dec. 31st, 1916.

R.N.A.S.—Flt. Comdr. specially promoted to Sqn. Comdr. for War Services:—R. H. Mulock, D.S.O., May 21st.

ADMIRALTY, June 29th, 1917.

## ROYAL NAVY.

COMDRS. TO BE CAPTS.

Harold D. Briggs. Robert M. Groves, D.S.O.

LT.-COMDR. TO BE COMDR.

Frederick C. Halahan, M.V.O.

## ROYAL NAVAL AIR SERVICE.

The following promotions have been made, to date June 30th:

WING COMDRS. TO BE WING CAPTS.

Harold D. Briggs (Actg. Wing Capt.). Frederick C. Halahan, M.V.O.  
Henry P. Smyth-Osbourne.

SQDN. COMDRS. TO BE WING COMDRS.

Douglas A. Oliver, D.S.O. John T. Cull, D.S.O.  
Alexander Ogilvie (Actg. Wing Comdr.). Hugh A. Williamson.  
Hon. Claud M. P. Brabazon. Henry M. Cave-Browne-Cave.  
Frederick W. Bowhill. Joseph R. W. Smyth-Pigott, D.S.O.  
Edmund D. M. Robertson.

SQDN. COMDR. TO BE ACTG. WING COMDR.

Francis K. McClean.

FLT. COMDRS. TO BE SQDN. COMDRS.

Francis G. Brodribb (Actg. Sqn. Comdr.). Allan K. Robertson.  
Tom D. Mackie. Bernard F. Fowler.  
Harold E. M. Watkins. Douglas Harries.  
Richard C. M. Pink. George H. Scott.  
Thomas W. Elsdon. Kenneth S. Savory, D.S.O.  
Ernest V. S. Wilberforce. Tom H. England, D.S.C.  
John Dunville. Vincent Nicholl, D.S.C.  
Charles F. Pollock. Bertram L. Huskisson, D.S.C.  
Robert C. Hayes. Edwin H. Dunning, D.S.C.  
Richard S. Robinson. The Hon. Roger Coke.  
Ralph J. J. Hope-Vere (Actg. Sqn. Comdr.). Henry N. M. Hardy, D.S.O.  
Ralph Whitehead. James I. Harrison.  
Gordon L. Thomson, D.S.C. Frederick J. Rutland, D.S.C.  
Roderic S. Dallas, D.S.C.

FLT. LTS. TO BE FLT. COMDRS.

Frederick M. L. Barr. Richard C. Hardstaff (Actg. Flt. Comdr.).  
Walter H. S. Garnett. Theophilus C. Vernon (Actg. Flt. Comdr.).  
Walter K. F. G. Warneford. Arthur F. F. Jacobs.  
Gerald E. Livock. Frank Fowler, D.S.C. (Actg. Flt. Comdr.).  
Frank G. Andreae. Alexander R. Cox (Actg. Flt. Comdr.).  
Charles B. Dalison (Actg. Flt. Comdr.). Colin T. MacLaren (Actg. Flt. Comdr.).  
Hugh C. Morris. Cecil D. Morrison (Actg. Flt. Comdr.).  
John D. Newberry (Actg. Flt. Comdr.). John R. Davison.  
Frank T. Digby, D.S.C. Edward S. Cripps.  
Christopher E. Wood (Actg. Flt. Comdr.). Bernard C. Windeler.  
Dudley W. A. Barton. Arthur H. Chandler.  
James B. P. Ferrand, D.S.O.  
John F. S. Morrison.  
Frederick G. D. Hards, D.S.C.

## THE R.N.A.S. HONOURS LIST FOR 1917.

## Special Promotions (continued).

Ernest A. O. Auldjo-Jamieson.  
 Denzil R. Thurstan.  
 Wilfred H. Dunn.  
 Reginald M. Everett (Actg. Flt. Comdr.).  
 Richard B. Munday (Actg. Flt. Comdr.).  
 George H. Jackson (Actg. Flt. Comdr.).  
 Matthew A. Simpson.  
 John S. Wheelwright.  
 Bruno P. H. de Roeper (Actg. Flt. Comdr.).  
 Reginald F. S. Leslie.  
 Ralph S. Booth.  
 Godfrey M. Thomas.  
 Christopher J. Galpin.  
 James G. Struthers.  
 Ronald S. Smith.  
 Stafford St. G. C. Belfield.  
 Charles L. Scott.  
 John B. Cole-Hamilton.  
 Henry K. Thorold, D.S.C. (Actg. Flt. Comdr.).  
 Ernest W. Norton, D.S.C. (Actg. Flt. Comdr.).  
 Egbert Cadbury, D.S.C.  
 Stanley Bell.  
 Brian C. Clayton (Actg. Flt. Comdr.).  
 Clarence MacLaurin.  
 Charles T. Freeman, D.S.C.  
 Guy V. Leather.  
 Cecil H. Hayward (Actg. Flt. Comdr.).  
 Charles C. R. Edwards, D.S.C. (Actg. Flt. Comdr.).  
 Horace E. Crawford.  
 Sebastian O. Smith.

## FLT. SUB-LTS. TO FLT. LTS.

Charles H. M. Chapman.  
 Michael Birkbeck.  
 Leo. P. Paine.  
 Charles N. Geale.  
 Augustine F. Marlowe.  
 Samuel M. Kinkead.  
 Llewellyn Edwards (Actg. Flt. Lt.).  
 Rupert E. Darnton.  
 Howard J. T. Saint.  
 Arthur T. Sketchley.  
 George C. V. Hewson.  
 Walter E. Traynor.  
 Henry E. Weaver.  
 Charles H. B. Jenner-Parson.  
 Carl D. Newman.  
 George H. Bittles.  
 Angus J. H. MacCall.  
 Reginald F. Maitland.  
 Reginald E. V. Jelliffe.  
 Paul D. Robertson.  
 Harold Tether (Actg. Flt. Lt.).  
 Charles E. Rich.  
 Howard V. Terry.  
 Frederick A. Best.  
 James F. Hart.  
 Geoffrey K. Blandy.  
 Joseph W. Hobbs.  
 Herbert G. Leslie.  
 Arthur G. Woodward.  
 John F. Dixon.  
 John R. Crouch.  
 Eric C. H. Tebb.  
 Bernard W. Hemsley.  
 George W. Biles.  
 Charles E. Burden.  
 Ormrod M. Ayrton.  
 Edward B. Waller.  
 John E. Barrs.  
 Lloyd Whitworth.  
 John A. Page.  
 Ernest J. Cuckney, D.S.C.  
 John S. N. Rockey.  
 Sidney J. Woolley.  
 George L. Hartgill.  
 Donald E. Harkness, D.S.C.  
 John H. Woolner.

Herbert G. Brackley, D.S.C. (Actg. Flt. Comdr.).  
 Stanley S. Goble, D.S.O., D.S.C. (Actg. Flt. Comdr.).  
 Frederick E. Sandford.  
 Gerald E. Hervey (Actg. Flt. Comdr.).  
 Maurice R. Buckland.  
 Herbert G. Travers (Actg. Flt. Comdr.).  
 William Tesh.  
 Henry G. R. Malet.  
 Alfred Ganimon.  
 Kenneth C. Buss.  
 Thomas F. Le Mesurier, D.S.C. (Actg. Flt. Comdr.).  
 William G. McMinnies (Actg. Flt. Comdr.).  
 Irwin N. C. Clarke, D.S.C. (Actg. Flt. Comdr.).  
 Robert J. O. Compston, D.S.O. (Actg. Flt. Comdr.).  
 Eric T. Bradley.  
 Forrester H. M. Maynard (Actg. Flt. Comdr.).  
 Francis J. Linnell.  
 William H. Watt.  
 Louis D. Morrison.  
 William F. Horner.  
 Athol W. Mylne.  
 Ralph A. Cochrane.  
 William E. Gardner, D.S.C. (Actg. Flt. Comdr.).  
 Charles D. Booker (Actg. Flt. Comdr.).  
 Alexander M. Shook (Actg. Flt. Comdr.).  
 Lloyd S. Breadner, D.S.C. (Actg. Flt. Comdr.).

Cecil G. Bronson.  
 Charles McNicholl, D.S.C.  
 Dudley B. M. Hume.  
 John E. A. Hoare.  
 Victor R. Scriven.  
 William M. Alexander.  
 Arthur F. Brandon.  
 Harold T. Mellings, D.S.C.

Hubert S. Broad.  
 Charles Gilmour.  
 Ronald R. Thorneley.  
 John E. Scott.  
 Leonard H. Rochford.  
 William H. Richardson.  
 John E. Brewin.

## OBSR. SUB-LTS. TO BE OBSR. LTS.

Gerald H. Courtenay Luck. Gurth A. Richardson.  
 Norman H. Starbuck.

July 4th.

R.N.V.R.—The undermentioned have been promoted for services with the R.N.A.S.—Temp. Lt.-Comdrs. to be temp. Comdrs.: Cecil H. Meares, Claude Kirby, June 30th, 1917.

Temp. Lts. to be temp. Lt.-Comdrs.: Philip L. Teed, George C. Neilson, George F. Herron, William Burningham-White, Edmund Hogg, Edward R. Peal, D.S.C., Spenser Flower, Edward N. G. Morris, Victor C. H. Longstaffe, Percy L. H. Dodson, Joseph E. Coates, Rowland D. Carey, Pearce Blair, Charles H. Parkes, Harold G. Atkinson, Viscount Tiverton, John K. Curwen, William J. S. Lockyer, William G. Chambers, Thomas F. Norbury, William H. Adkins, Frederick T. Ashford, Arthur Partridge, Cyril R. Andrews, Charles R. Abbott, George M. T. Rees, Charles J. Murfitt, Arthur F. Sidgreaves, Michael H. P. Allen, James D. K. Restler, James P. A. Waller, Henry A. R. Norton, Rene Bull, Alfred S. Hellawell, Arthur S. Langley, Warwick Wright, June 30th, 1917.

Temp. Sub-Lts. to be temp. Lts.: John D. Greenwood, April 1st, 1917. Joseph T. Chitty, Colin A. Crow, Herbert G. P. Rees, Charles H. Nelson, Arnold L. Howarth, Arthur B. Hatton, Bernard J. Beeton, John Ree, Sidney H. Brazier, Noel V. Wrigley, Richard F. Osborne, Clive C. Clarke, Edward A. Wadsworth, Arthur J. Osborn, Harry C. Willson, Charles F. Smith, Noel W. Hughes, James D. Fry, James D. Whitelaw, Archibald A. Bryce Buchanan, Hermes G. L. de Whalley, Arthur M. Humble-Crofts, Arthur B. Murray, Horace O. Merriman, Clement H. Swann, Percival M. Davson, John W. Morley, William T. Morris, June 30th, 1917.

R.N.A.S.—Sqn. Comdr. to be Wing Comdr.: Wilfred Briggs, June 30th, 1917.

Aug. 4th.

Temp. Flt. Sub-Lts. specially promoted to temp. Flt. Lts. for meritorious war service:—J. A. Glen, H. F. Beamish, Aug. 5th.

Aug. 26th.

Aug. 30th.—R.N.A.S.—Temp. Actg. Flt. Lt. Alfred W. Jones, D.S.C., specially promoted to temp. Flt. Lt. for meritorious service in the field, Aug. 28th, 1917.

Nov. 7th.

R.N.A.S.—Temp. Flt. Sub-Lt. to be temp. Flt. Lt. (specially for meritorious war services):—E. T. Hayne, Nov. 7th.

Nov. 17th.

## SPECIAL PROMOTION FOR SERVICES IN ACTION.

R.N.A.S.—Actg. Flt. Comdr. R. Graham to be Flt. Comdr. Dated Oct. 20th.

\* \* \*

The following promotions have been made to date Dec. 31st, 1917:—

## WING COMDRS. TO BE WING CAPTS.

Charles R. Samson, D.S.O. Roland C. S. Hunt.  
 Arthur M. Longmore. Robert H. Clark-Hall.

## WING COMDR. TO BE ACTG. WING CAPT.

John D. Mackworth.

## SQDN. COMDRS. TO BE WING COMDRS.

James L. Travers. Peregrine F. M. Fellowes  
 Arthur C. Barnby. (Actg. Wing Comdr.)  
 Cecil F. Kilner, D.S.O. Charles D. Breese.  
 Douglas H. Hyde-Thomson. Geoffrey R. Bromet, D.S.O.  
 William C. Hicks. (T.) Harry Delacombe (Actg. Wing Comdr.)  
 Charles R. F. Noyes. Henry R. Busted.  
 Charles H. K. Edmonds, D.S.O. (T.) The Master of Sempill.  
 Alexander D. Cunningham. Redford H. Mulock, D.S.O.

## SQDN. COMDRS. TO BE ACTG. WING COMDRS.

Francis E. T. Hewlett. (T.) Tom D. Mackie.  
 Ivor G. V. Fowler. (T.) John Dunville.  
 Richard E. C. Peirse, D.S.O. Charles F. Pollock.  
 James W. O. Dalgleish.

## FLT. COMDRS. TO BE SQDN. COMDRS.

William G. Sitwell. Hugh C. Fuller.  
 Ronald H. Kershaw. James D. Maude.  
 Christopher Draper (Actg. Sqn. Comdr.) Conway W. H. Pulford (Actg. Sqn. Comdr.)  
 (T.) Sidney V. Sippe, D.S.O. Anthony R. Arnold (Actg. Sqn. Comdr.)  
 (Actg. Sqn. Comdr.)

George D. Kirkpatrick.  
 Hilary G. Nares.  
 Robert E. Spear.  
 Rupert R. Winter.



## THE R.N.A.S. HONOURS LIST FOR 1917.

## Special Promotions (continued).

Philip L. Holmes, D.S.C.  
 Norman S. Douglas.  
 Irving H. B. Hartford.  
 Reginald E. Nicoli.  
 Harold F. Towler.  
 (T.) Harold A. Buss, D.S.C.  
 (T.) Hon. Gilbert de St. C. Rollo.  
 (T.) Edwin R. Moon, D.S.O.  
 Maurice E. A. Wright.  
 Rupert E. Penny.  
 John S. Mills, D.S.C.  
 Eric J. Hodsoll (Actg. Sqdn. Comdr.)  
 Brian S. Benning.  
 Roger M. Field.  
 George F. Breese, D.S.C.  
 William L. Welsh (Actg. Sqdn. Comdr.)  
 (T.) Ivor Fraser.  
 (T.) Theodore D. Hallam, D.S.C.  
 (T.) Benjamin Travers.

## FLT. COMDRS. TO BE ACTG. SQDN. COMDRS.

William H. Wilson.  
 George C. Colmore.  
 Basil Binyon.

## ACT. FLT. COMDR. CONFIRMED IN RANK, AND PROMOTED TO ACTG. SQDN. COMDR.

Percival Owen.

## FLT. LTS. TO FLT. COMDRS.

(T.) Frederick W. Merriam (actg. Flt. Comdr.)  
 (T.) William H. Elliot (actg. Flt. Comdr.)  
 Guy W. Price (actg. Flt. Comdr.)  
 Ralph S. Sorley  
 Gilbert F. Smylie, D.S.C.  
 (T.) William Peer Groves (actg. Flt. Comdr.)  
 Harry R. Hopperton.  
 Grahame Donald.  
 Francis J. E. Feeny (actg. Flt. Comdr.)  
 John Forgan-Potts (actg. Flt. Comdr.)  
 John P. Coleman.  
 Ernest L. Johnston.  
 Frank Cleary.  
 (T.) Edward A. de L. de Ville (actg. Flt. Comdr.)  
 George A. Cox.  
 Charles F. Latimer (actg. Flt. Comdr.)  
 Stanley B. Joyce.  
 George G. Ommanney.  
 Louis C. Keeble (actg. Flt. Comdr.)  
 (T.) Henry S. Neville.  
 (T.) Maximilian H. Spencer.  
 (T.) Arthur D. W. Allen, D.S.C. (actg. Flt. Comdr.)  
 (T.) Frank U. Y. Weldon.  
 Thomas P. Y. Moore.  
 Percy E. Maitland.  
 Patrick G. N. Ommanney.  
 Wilfred Underhill.  
 Archibald H. Wann  
 Thomas W. Elmhirst.  
 William P. C. Chambers.  
 Ivo C. Little.  
 John A. Barron.  
 (T.) Osborne A. Butcher, D.C.S. (actg. Flt. Comdr.)  
 David Gill (actg. Flt. Comdr.)  
 (T.) Basil E. P. Gregg (actg. Flt. Comdr.)  
 Henry McClelland, D.S.C.  
 (T.) Frank S. McGill.  
 (T.) Noel Keeble, D.S.C. (actg. Flt. Comdr.)  
 (T.) Malcolm, D.S.C. (actg. Flt. Comdr.)  
 (T.) Malcolm Bartlett.  
 (T.) William M. Tait.  
 (T.) John E. M. Pritchard  
 (T.) Arnold H. Sandwell.

James C. P. Wood.  
 Eustace F. Moyes.  
 (T.) Arthur Q. Cooper, D.S.C.  
 Frederick W. Gamwell.  
 Lawrence P. Openshaw.  
 (T.) Cuthbert E. Brisley.  
 William G. Moore, D.S.C.  
 Thomas V. Lister.  
 James E. B. Maclean, D.S.C.  
 Frederick W. Lucas.  
 (T.) Guy W. Cranfield.  
 (T.) William C. Michie.  
 Reginald B. B. Colmore.  
 (T.) Bertram C. Bell, D.S.O., D.S.C.  
 (T.) John R. Davison.  
 (T.) Bruno P. H. de Roeper.  
 Ernest W. Norton, D.S.C. (Actg. Sqdn. Comdr.)  
 (T.) Stanley J. Goble, D.S.O., D.S.C. (Actg. Sqdn. Comdr.)  
 (T.) Frederick E. Sandford.  
 (T.) Kenneth C. Buss.

## ACTG. SQDN. COMDRS.

Edward J. C. Roberts.  
 (T.) William H. Watt.

(T.) Raymond Collishaw, D.S.O., D.S.C. (actg. Flt. Comdr.)

## FLT. SUB-LTS. TO FLT. LTS.

Reginald Chambers.  
 (T.) Thomas C. Angus.  
 (T.) Lionel C. W. Trend.  
 (T.) William E. McConnell.  
 (T.) Kene J. M. de St. Leger.  
 (T.) Kenneth G. Boyd.  
 (T.) Douglas W. Gray.  
 (T.) Albert H. V. Fletcher.  
 (T.) Claver V. Bessette.  
 (T.) Percy C. C. Passman.  
 (T.) William O. F. Harding.  
 (T.) David D. Findlay.  
 (T.) Arthur W. Williams (Actg. Flt. Lt.)  
 (T.) Edward E. Barnard.  
 (T.) George H. D. Gossip.  
 (T.) Harry L. Nunn.  
 (T.) Henry J. Bath.  
 (T.) Hugh A. Wilson.  
 (T.) Wellington C. Ault.  
 (T.) William V. Simons.  
 (T.) Oscar S. Stiles.  
 (T.) Bertie A. Millson.  
 (T.) Edwin A. Power.  
 (T.) Eric J. Crisp.  
 (T.) William D. Jackson.  
 (T.) Robert B. Frame.  
 (T.) Peter H. Martin (Actg. Flt. Lt.)  
 (T.) Frederick E. Fraser, D.S.C.  
 (T.) Harold J. Roach.  
 (T.) Gerald M. Part.  
 (T.) Ernest P. Will.  
 (T.) Edgar A. Bolton.  
 (T.) Stanley F. Ingram.  
 (T.) William J. de Salis, D.S.C.  
 (T.) John S. Wright, D.S.C.  
 (T.) Edward W. Keesey.  
 (T.) Ernest G. F. Thompson.  
 (T.) Cecil R. Vaughan.  
 (T.) George W. Parker.  
 (T.) Frank H. McMaster.  
 (T.) Philip H. Mackworth.  
 (T.) Richard G. Clarke.  
 (T.) John de C. Paynter.  
 (T.) Charles A. Narbeth.  
 (T.) William E. Foster.  
 (T.) Gerald K. Cooper.  
 (T.) Harold H. Gonyon.  
 (T.) Edward E. Maitland-Heriot, D.S.C. (Actg. Flt. Lt.)  
 (T.) Clifford Hanson-Abbott (Actg. Flt. Lt.)  
 (T.) Frederick V. Branford.  
 (T.) Trevor W. S. Harris.  
 (T.) Maurice W. Buckley.  
 (T.) Edward R. Barker, D.S.C.  
 (T.) Lea E. B. Wimbush.  
 (T.) Geoffrey W. Hemming, D.S.C.  
 (T.) Tom C. Trumble.  
 (T.) Alan C. Bishop.  
 Bernard J. W. Brady.  
 (T.) Albert W. Fletcher.  
 (T.) Charles R. Rischbieth.  
 (T.) Francis S. G. Lewis (Actg. Flt. Lt.)  
 (T.) Philip G. Williams.  
 (T.) Alan B. Helcroft.  
 (T.) Edward B. Drake.  
 (T.) Arthur I. Taylor.  
 (T.) Leslie V. Kohn.  
 (T.) Fernley J. Hosking.  
 (T.) Lord Ossulston.  
 (T.) David Plaistowe.  
 (T.) Frederic R. Johnson, D.S.C.  
 (T.) Ronald M. Keirstead (Actg. Flt. Lt.)

(T.) Joseph S. T. Fall, D.S.C. (actg. Flt. Comdr.)  
 (T.) William M. Alexander, D.S.C. (actg. Flt. Comdr.)

(T.) John R. Allan, D.S.C.  
 (T.) Edward D. Crundall.  
 (T.) John M. Turner.  
 (T.) Charles R. Lupton, D.S.C.  
 (T.) Leslie H. Brake.  
 (T.) Algernon Holand.  
 (T.) Godfrey E. Wildman-Lushington.  
 (T.) Leonard H. Cockey.  
 (T.) Robert B. Freeland.  
 (T.) Geoffrey P. C. Greene (Actg. Flt. Lt.)  
 (T.) John Hodson.  
 (T.) Aubrey M. Tidey.  
 (T.) Arthur T. Barker.  
 (T.) John Gamon.  
 (T.) Arthur W. Kay.  
 (T.) Cyril F. Brewerton (Actg. Flt. Lt.)  
 (T.) Hippolyte F. Delarue.  
 (T.) George L. Elliott.  
 (T.) Arnold Adamson.  
 (T.) Brian R. Millar.  
 (T.) Thomas A. Gladstone.  
 (T.) Euan Dickson, D.S.C.  
 (T.) Archibald C. Reid.  
 (T.) Harold M. Morris, D.S.C.  
 (T.) Norman C. Harrison.  
 (T.) Arthur R. Stack.  
 (T.) Frederic C. Lander.  
 (T.) Harold H. Booth.  
 (T.) Harold E. Mott.  
 (T.) Wilfred A. Curtis, D.S.C. (Actg. Flt. Lt.)  
 (T.) Thomas K. Thyne.  
 (T.) Rowan H. Daly, D.S.C.  
 (T.) Adrian J. B. Tonks.  
 (T.) Thomas C. Pattinson.  
 (T.) Lindsay W. S. Cutler.  
 (T.) John W. B. Critgen.  
 (T.) Olive C. Le Boutillier.  
 (T.) Norman D. Hall.  
 (T.) Norman M. Scott (Actg. Flt. Lt.)  
 (T.) Henry W. Kendall.  
 (T.) Goodwin H. T. Barnes.  
 (T.) Cecil J. Clayton.  
 (T.) Roderick McDonald.  
 (T.) Hubert C. Lemon.  
 (T.) Alexander R. Knight.  
 (T.) Charles E. S. Iusk.  
 (T.) Arthur C. Burt (Actg. Flt. Lt.)  
 (T.) George R. Marshall (Actg. Flt. Lt.)  
 (T.) Wilfred R. D. Acland.  
 (T.) Norman H. Woodhead.  
 (T.) Harold F. Stackard.  
 (T.) Philip B. Silk.  
 (T.) Henry R. de Wilde.  
 (T.) William L. Jordan, D.S.C.  
 (T.) William F. Dickson.  
 Francis J. Vincent (Actg. Flt. Lt.)  
 (T.) Robert M. Stirling.  
 (T.) Frederick G. Herstmann.  
 (T.) Charles L. Young, D.S.C.  
 (T.) John W. Pinder.  
 (T.) Francis J. W. Mellersh.  
 (T.) Ronald Jarman, D.S.C.  
 (T.) Stanley W. Rosevear, D.S.C.  
 (T.) Ralph E. Carroll.  
 Sidney T. Freeman.  
 (T.) John P. Hales.  
 (T.) Louis D. Bawlf.  
 (T.) John E. L. Hunter, D.S.C.  
 (T.) Oliver W. Redgate.  
 (T.) Edward M. Knott.

## THE R.N.A.S. HONOURS LIST FOR 1917.

## Special Promotions (continued).

OBSR. LTS. TO BE FLT. OBSRS.

(T.) Ronald G. St. John, (T.) Russell, W. Gow, D.S.O.,  
D.S.C. D.S.C.  
(T.) Vincent Greenwood. (T.) Eric B. C. Betts, D.S.C.  
(T.) Hector A. Furniss.

OBSR. SUB-LTS. TO BE OBSR. LTS.

(T.) Stanley E. Hoblyn. (T.) Duncan G. McGregor.  
(T.) Eric G. Hutton. (T.) Leonard Ritson.  
(T.) Alick C. Stevens. (T.) Bernard E. Harrison.  
(T.) Frederick C. F. Walwyn. (T.) Alan E. Sole.  
(T.) Lewis G. Le B. Croke. (T.) William S. Anderson.  
(T.) Thomas H. Piper. (T.) Gilbert G. Speight.  
(T.) Robert Redfern. (T.) Robert W. Greenwood.

T.—for temporary service.

Temp. Lt.-Comdrs., R.N.V.R., to be Temp. Comdrs., R.N.V.R.—  
Patrick H. Edwards, Lawrence H. Strain, D.S.C. (actg.  
Comdr., R.N.V.R.), Frederick S. Pilling, Thomas A. Monckton,  
Robert W. Hogarth.

Temp. Lts., R.N.V.R., to be Temp. Lt.-Comdrs., R.N.V.R.—  
Viscount Maidstone, Thomas B. Lloyd, Felton Atkinson (actg.  
Lt.-Comdr.), James Arthur, Robert F. Le Bailly, Oliver G. G.  
Villiers, Vincent C. Richmond, Rowland B. Berkeley, Sidney  
P. V. Phillips, Sidney M. Cleverley, Claude Suckling, Harry  
Dodd, Benjamin H. N. H. Hamilton, James W. Collinson,  
Richard J. P. Briggs, Charles W. Nutting, D.S.C., John B.  
Vernon, Kenyon Secretan, Reginald L. Alderson, Oswald H.  
Powell, Charles F. Abell, John W. Lintott, Robert V. Mostyn,  
Edelsten Dalziel, Charles J. Price, Lord Clifton, Marmaduke  
Marsden, John A. Williams, William C. Power, Ernest Darrell-  
Huskinson, Francis R. E. Davies (actg. Lt.-Comdr.), John R.  
Potter, Arthur R. Layard, John K. Wells, William J. Ployblank,  
Frederick C. Chambers, Cuthbert A. L. Harrison, Richard M. S.  
Veal, Arthur C. Wade, John C. M. Lowe, Thomas R. H. Garrett,  
John P. Elsdon, Thomas B. Meyer, Samuel J. V. Fill, John G. T.  
Crawford, Thomas L. Oliver, James B. Handley-Seymour, Albert  
E. Pettingell, William H. T. Rampling-Rose, Douglas Illing-  
worth, Percy B. J. Murrell, Thomas S. Price, John G. Bayes,  
The Hon. William T. Whiteley, William J. Fernie, William H.  
Reid, Harold I. Dear, Norman Sladden, Alfred J. Currie.

Temp. Sub-Lts., R.N.V.R., to be Temp. Lts., R.N.V.R.—  
Thomas J. Hamp, Algernon E. Courage, Eric A. Houghton, Eric  
D. H. Robinson, Herman W. Bamber, John H. Hagon, Frank  
A. Barton, Stanley J. Green, Basil G. Ludlow, Thomas H.  
Harkness, Roland Champness, Cyril S. Goddard, Sydney J. W.  
Baldwin, William B. Sinclair, Walter J. Salaman, William H.  
Rodd, Cecil Hayes, Charles R. E. Pope, William H. B. Sandes,  
Thomas F. Gillespie, Frederick K. Wells, Edward S. Davis,  
Charles A. Proctor, Richard G. G. Maund, Thomas Holmes,  
Lionel E. Sawyer, David F. Lucking.

Warrt. Officers, II, to be Warrt. Officers, I.—Thomas C.  
James, Francis E. Finzel, Alfred E. Hunn, Harry G. Cooper,  
Samuel C. Tucker, James H. Ormsby (Temp. Lt., R.N.V.R.),  
Albert T. E. Witt, Allan Lanman, Frederick E. Bishop, H. Mc-  
Grane, William G. J. Wardle (Temp. Lt., R.N.V.R.), Francis  
S. Offier.

## MENTIONED IN DISPATCHES.

Feb. 8th.  
Dispatch from Lt.-Gen. the Hon. J. C. Smuts, C.-in-C., E.  
Africa, for meritorious services in the Field:—

Robinson, Temp. Flt. Sub-Lt. J., Naval Wing; Stewart-  
Dawson, Temp. Flt. Sub-Lt. N. G., Naval Wing.  
Russell, No. 226512 C.P.O., 3rd Gr., H.; Brooke, No.  
F7963 Leading Mech. S. A.; Chapple, No. E7181 P.O. Mech.  
W. A.

Flt. Lt. Henry Guy Holden, R.N.A.S.

April 22nd.

May 12th.  
Wing Comdr. Christopher Lloyd Courtney, R.N.; Fleet Payr.  
Frederick Richard Waymouth, R.N.; Actg. Wing Comdr. Alec  
Ogilvie, R.N.A.S.; Sqdn. Comdr. Francis Esme Theodore Hew-  
lett, R.N.; Flt. Comdr. William Lawrie Welsh, R.N.A.S.; Actg.  
Flt. Comdr. Robin Gordon Mack, R.N.A.S.; Actg. Flt. Comdr.  
Bryan Charles Clayton, R.N.A.S.; Flt. Lt. Grant Armstrong  
Goederham, R.N.A.S.; Flt. Lt. Charles Dawson Booker,  
R.N.A.S.; Lt. Lionel Edwin Innes-Baillie, R.M.A.; Lt. Oliver  
George Graham Villiers, R.N.V.R.; Lt. Ronald George St. John,  
R.N.V.R.; Flt. Sub-Lt. Jean de Francia, R.N.A.S.; Flt. Sub-  
Lt. Francis Domine Casey, R.N.A.S.

Warrt. Officer, 2nd Gr., Thomas Martin, R.N.A.S.; Actg.  
Warrt. Officer, 2nd Gr., Norman Littlejohn, R.N.A.S.; P.O.  
Mech. Roland Alfred Siburn, O.N. F2418; P.O. Mech. Walter  
George Jones, O.N. J5596; C.P.O. Mech., 3rd Gr., Alfred Ernest  
Le Sueur, O.N. F3413; Ldg. Mech. Oliver Douglas Robson, O.N.  
F4735; P.O. Mech. Reginald Arthur Clarke, O.N. F3896; Air  
Mech., 1st Gr., John McKimmie Young, O.N. F3652; P.O. Mech.  
Donald Brigham, O.N. F641; P.O. Mech. Philip Hiram Dim-  
mick, O.N. F1207; Air Mech., 1st Gr., Frederick John George,

O.N. F1997; P.O. Mech. Sidney John Petts, O.N. F1717; Air  
Mech., 1st Gr., Alfred Dunn, O.N. F9172; Ldg. Mech. Edgar  
Harold Restall, O.N. F2468; Air Mech., 1st Gr., Francis George  
Parker, O.N. F2358; P.O. Mech. William Arthur Hill, O.N.  
F4596; P.O. Mech. Horace Dawson, O.N. F4755; P.O. Mech.  
Alfred Herbert Doyle, O.N. F4214; Air Mech., 1st Gr., Frede-  
rick Metcalf, O.N. F8944; C.P.O. Mech., 3rd Gr., William  
Wilson Pope, O.N. F1712; P.O. Mech. William Griffiths, O.N.  
F8339; Ldg. Mech. John Balfour Nesbitt, O.N. F2390; Air  
Mech., 1st Gr., Robert John Hepworth, O.N. F2175; Ldg. Mech.  
Thomas Henry Cross, O.N. F976; Ldg. Mech. Septimus New-  
bury, O.N. F1209.

June 15th.

Dispatch from Rear-Admiral E. Charlton, C.-in-C., Cape of  
Good Hope Station, for services in E. Africa:—

Flt. Lt. E. R. Moon, R.N.; Flt. Lt. J. E. B. Maclean, R.N.;  
C.P.O. (C) J. Noonan, R.N.A.S., M2345 (Po.); Air Mech., 1st  
Gr., F. Wilmshurst, R.N.A.S., J29563 (Po.).

For services with the Military Forces in E. Africa:—

Flt. Lt. John Robinson, R.N.A.S.; Lt. Ivor Mackenzie Bel-  
lairs, R.N.V.R.; C.P.O. Mech., 2nd Gr., A. H. Simmonds,  
M443 (Cha.); C.P.O. Mech., 3rd Gr., H. Russell, 226512 (Cha.);  
Ldg. Mech. S. A. Brooke, F7963; C.P.O. 3rd Gr., W. A.  
Chapple, F7181; E. Mathais, M6508 (Dev.); Ldg. Mech. A. F.  
Wardle, F7334; Air Mech., 2nd Gr., J. H. Seager, F7818; Actg.  
Air Mech., 1st Gr., A. E. Liles, F7811.

June 22nd.

Sqdn. Comdr. Joseph Ruscombe Wadham Smyth-Pigott, D.S.O.,  
R.N.; Flt. Comdr. Theodore Douglas Hallam, D.S.C.,  
R.N.A.S.; Flt. Sub-Lt. John Roderick Ross, R.N.A.S.; Mid.  
Edward Rupert Snow, R.N. (since killed); Air Mech., 1st Cl.  
Walter Thomas Hollidge, O.N. F8633 (since died of injuries).

July 18th.

Lt.-Gen. G. F. Milne's dispatch from Salonika, dated March  
29th:—

Smyth-Pigott, Lt. (Actg. Sqdn. Comdr.) J. R. W., D.S.O.

July 20th.

Flt. Lt. Edward James Pointer Burling, R.N.A.S.; Flt. Lt.  
Humphrey de Verd Leigh, R.N.A.S.; Flt. Lt. Frederick Middle-  
ton Fox, R.N.A.S.; Flt. Lt. Henry Vernon Worrall, R.N.A.S.;  
Flt. Lt. Thomas Gordon Mair Stephens, R.N.A.S.; Flt. Lt. John  
Edward Scott, R.N.A.S.; Flt. Sub-Lt. Rwan Heywood Daly,  
R.N.A.S.; Lt. William Charles Abbott Meade, R.N.V.R.

For service against submarines:—

Sqdn. Comdr. Ralph James Jean Hope-Vere, R.N.A.S.

Aug. 11th.

Flt. Comdr. J. G. Struthers, R.N.A.S.; Air Mech., 1st Gr.,  
G. H. Ellis, O.N. F3423.

Sqdn. Comdr. R. H. Mulock, D.S.O., R.N.A.S.; Flt. Lt.  
W. R. Mackenzie, D.S.C., R.N.A.S.; Flt. Sub-Lt. R. F. L.  
Dickey, D.S.C., R.N.A.S.; Flt. Sub-Lt. F. R. Johnson,  
R.N.A.S.; Flt. Sub-Lt. A. H. Lofft, R.N.A.S.; A.C., 2nd Gr.,  
J. W. George, O.N. F20006.

Aug. 15th.

Dispatch from Lt.-Gen. Sir Stanley Maude, C.-in-C., Meso-  
potamia:—

Cassy, Flt. Lt. A. W.; Lyon, Flt. Sub-Lt. M.; Verey, Lt.  
D. R., R.N.V.R.; Wrottesley, Comdr. F. R., R.N.

Brennan, F7736 Air Mech., 1st Gr., T.; Cowton, Ply. 13554  
C.P.O., 2nd Gr., A. E.; Cracknell, F8912 Ldg. Mech. C. L.;  
Freeman, F4667 Ldg. Mech. R. C.; Veale, F9262 P.O. Mech.  
A. H.; Ward, F9274 Ldg. Mech. P. H.; Young, F9291 Air  
Mech., 1st Gr., E. W.

Aug. 29th.

Flt. Sub-Lt. H. B. Smith, R.N.A.S.; Air Mech., 2nd Gr.,  
E. W. Argent, O.N. F13482.

Sept. 14th.

Flt. Comdr. Charles Teverill Freeman, D.S.C., R.N.A.S.; Flt.  
Comdr. Thomas Frederick Le Mesurier, D.S.C., R.N.A.S.; Flt.  
Sub-Lt. Sidney Ernest Ball, R.N.A.S.; Flt. Sub-Lt. Arthur  
Thomas Barker, R.N.A.S.; Air Mech., 2nd Gr., Walter James  
Priest, O.N. F21948.

Sept. 21st.

Dispatch from Vice-Admiral Sir Rosslyn Wemyss, operations on  
the Tigris:—

"The 14th Kite Balloon Section, R.N.A.S., commanded by  
Comdr. Francis R. Wrottesley, R.N., marked for us on many  
occasions besides the useful work it has done keeping look-out  
for the Army."

Oct. 1st.

## PATROLS AND SUBMARINE SEARCHING

Wing. Comdr. F. L. M. Boothby, R.N.; Wing Comdr., J. N.  
Fletcher, R.N.A.S.; Sqdn. Comdr. C. R. Finch-Noyes, R.N.;  
Sqdn. Comdr. J. W. O. Dalgleish, R.N.; Sqdn. Comdr. L. Tom-  
kinson, R.N.

Flt. Comdr. E. B. Beauman, R.N.A.S.; Flt. Comdr. I. H. B.  
Hartford, R.N.A.S.; Flt. Comdr. G. E. Livock, R.N.A.S.; Flt.  
Comdr. F. G. D. Hards, D.S.C., R.N.A.S.; Flt. Comdr. W. H.



## THE R.N.A.S. HONOURS LIST FOR 1917.

## Mentioned in Despatches (continued).

Watt, R.N.A.S.; Flt. Comdr. J. B. Cole-Hamilton, R.N.; Actg. Flt. Comdr. A. Durstan, R.N.A.S.

Flt. Lt. J. A. Barron, R.N.; Flt. Lt. E. R. H. Turnour, R.N.; Lt. J. M. Burke, R.N.V.R.; Flt. Lt. H. A. Panthorpe, R.N.A.S. (since killed); Flt. Lt. C. J. Hallinan, R.N.A.S.; Flt. Lt. C. W. Scott, R.N.A.S.; Flt. Lt. S. E. Taylor, R.N.A.S.; Flt. Lt. G. F. Meager, R.N.A.S.; Flt. Lt. T. H. Newton, R.N.A.S.; Flt. Lt. J. O. Galpin, D.S.C., R.N.A.S.; Flt. Lt. G. R. Hodgson, R.N.A.S.

Flt. Sub-Lt. F. S. Mills, R.N.A.S.; Flt. Sub-Lt. K. G. Boyd, R.N.A.S.; Flt. Sub-Lt. H. L. F. McLean, R.N.A.S.; Flt. Sub-Lt. F. H. McMaster, R.N.A.S.; Flt. Sub-Lt. C. S. Iron, R.N.A.S.; Flt. Sub-Lt. W. F. Dickson, R.N.A.S.; Obsr. Sub-Lt. D. S. Eirp, R.N.A.S.

C.P.O. Mech., 2nd Gr., J. Wrigley, O.N. F469; C.P.O. Mech., 2nd Gr., H. T. Duke, O.N. F17272 (now Warrt. Officer, 2nd Gr.); C.P.O. Mech., 3rd Gr., R. W. Johnson, O.N. 13837 (Po.); C.P.O. Mech., 2nd Gr., W. Godfrey, O.N. 230931 (Po.); C.P.O. Mech., 2nd Gr., J. Rodger, O.N. M2435 (Ch.); Air Mech., 1st Gr., R. Reekie, O.N. F8923; Ldg. Mech., 1st Gr. (E.), G. I. Smith, O.N. F3501; C.P.O. Mech., 3rd Gr., H. D. Lane, O.N. F692; Boy Mech. C. Kidd, O.N. F5004; Ldg. Mech. R. Connor, O.N. F4597; C.P.O. Mech., 3rd Gr., G. E. Franklin, O.N. 239138; C.P.O. Mech., 2nd Gr., A. J. Corbett, O.N. F54 (now Warrt. Officer, 2nd Gr.); P.O. Mech. J. W. Long, O.N. K2075 (Po.); P. O. Mech. G. Regan, O.N. 218371 (Dev.); Ldg. Mech. G. H. Ellis, O.N. F3423; Ldg. Mech. T. W. Thirlwall, O.N. F9430; Air Mech., 2nd Gr., F. Jones, O.N. F5785; C.P.O. Mech., 3rd Gr., T. O. Oakes, O.N. 238732 (Ch.); Ldg. Mech. J. E. Lawrence, O.N. F8762; Air Mech., 1st Gr., D. McKenzie, O.N. F760; Ldg. Mech. H. Lee, O.N. F3239; Ldg. Mech. E. B. Turner, O.N. F3509; Air Mech., 2nd Gr., J. E. Martin, O.N. J34195; C.P.O. Mech., 3rd Gr., W. Morgan, O.N. M2399 (Dev.); P.O. Mech. B. F. Strand, O.N. F344; C.P.O. Mech., 3rd Gr., H. E. Bennell, O.N. 234260 (Ch.); C.P.O. Mech., 3rd Gr., H. J. Richer, O.N. F303; Air Mech., 2nd Gr., E. C. Carter, O.N. F9726; Ldg. Mech. A. H. Gaunt, O.N. F785; P. O. Mech. S. J. Heath, O.N. 201503 (Po.); Ldg. Mech. S. J. Leith, O.N. F3516; C.P.O. F. S. Close, R.N.R., O.N. 326 WTS; Air Mech., 2nd Gr., D. T. Williams, O.N. F6537; Air Mech., 1st Gr. (E.), W. L. Le Maitre, O.N.

F3937; P.O. Mech. L. Stokes, O.N. F3346; Air Mech., 1st Gr., F. V. Griffin, O.N. F12487; Ldg. Mech. W. J. Baker, O.N. F5926; Air Mech., 2nd Gr., G. H. Windsor, O.N. F8790; Ldg. Mech. (E.), F. W. Avery, O.N. F3209.

## EASTERN MEDITERRANEAN.

Sqdn. Comdr. E. H. Dunning, D.S.C., R.N.A.S. (since killed); Flt. Comdr. E. T. Bradley, R.N.A.S.

Flt. Lt. E. P. Hicks, R.N.A.S.; Air Mech., 1st Gr., F. E. Downs, O.N. F6091; C.P.O. Mech., 2nd Gr., R. A. Wells, O.N. F531; C.P.O. Mech., 3rd Gr., L. D. Stewart, O.N. F229; Ldg. Mech. E. H. Purdy, O.N. F1494; C.P.O. Mech., 2nd Gr., E. Whittlesea, O.N., 344343 (Ch.) (now Warrt. Officer, 2nd Gr.); C.P.O. Mech., 2nd Gr., C. Parsons, O.N. F205; C.P.O. Mech., 3rd Gr., G. Lambourne, O.N. 351593 (Po.) (now Warrt. Officer, 2nd Gr.).

Nov. 2nd.

Sqdn. Comdr. C. H. Butler, D.S.O., D.S.C., R.N.A.S.; Flt. Sub-Lt. (now Flt. Lt.) C. H. FitzHerbert, R.N.A.S.; Flt. Sub-Lt. M. A. Harker, R.N.A.S.; Flt. Sub-Lt. E. B. Drake, R.N.A.S.; P.O. (E.) A. A. B. Cox, O.N. F17751.

## FOR SERVICES AGAINST SUBMARINES.

Flt. Sub-Lt. Tom Compton Trumble, R.N.A.S.

Nov. 17th.

Flt. Comdr. A. S. Douglas, R.N.A.S.; Lt. M. W. W. Cross, R.N.V.R.; Flt. Lt. B. D. Hobbs, D.S.O., D.S.C., R.N.A.S.; Flt. Sub-Lt. E. V. Reid, D.S.C., R.N.A.S. (since killed); Air Mech., 2nd Gr., H. M. Davies, O.N. F20254.

## FOR SERVICES AGAINST SUBMARINES.

Flt. Comdr. J. S. F. Morrison, R.N.A.S.

Nov. 30th.

## FOR SERVICES WITH R.N.A.S.

Lt. H. O. Fry, R.N.V.R.

Dec. 19th.

Flt. Sub-Lt. (now Flt. Lt.) P. K. Fowler, R.N.A.S.

## FOR SERVICES AGAINST SUBMARINES.

Flt. Lt. B. D. Hobbs, D.S.O., D.S.C., R.N.A.S.; Flt. Lt. J. L. Gordon, R.N.A.S.; Flt. Sub-Lt. (now Flt. Lt.) R. F. L. Dickey, D.S.C., R.N.A.S.; Flt. Sub-Lt. C. J. Clayton, R.N.A.S.; Obsr. Sub-Lt. K. G. Coles, R.N.A.S.

Air Mech., 2nd Gr., H. M. Davies, D.S.M., O.N. F20254.

## WHAT NOTS.

[The following is taken, without permission, from that entertaining R.N.A.S. publication, "The Flypaper," the Editor of which accepts no responsibility in case any of the matters mentioned bear some resemblance to facts.—Ed., THE AEROPLANE.]

H.M.S. "Precedent,"

Submitted:

Jan. 1st, 1915.

It is requested that attached demand for two What Nots may be approved as they are urgently required for use in Ward Room.

Hotel Seashell,

Room 15,000,

July 1st, 1915.

With reference to demand No. 16425/F.O. for Nots What, two in number, it is observed that these stores come under sub-head Z.5. The demand should therefore be amended accordingly.

H.M.S. "Precedent,"

Submitted:

July 2nd, 1915.

With further reference to demand No. 16425/F.O., and in reply to your letter of the 1st inst., the demand for Nots What, two in number, is amended and forwarded herewith for approval.

Hotel Seashell,

Room 15,000,

Nov. 30th, 1915.

Adverting to demand No. 16425/F.O., dated Jan. 1st, it is requested that the following particulars may be furnished:—

(a) Purpose for which Nots What, two in number, are required.

(b) Dimensions of Ward Room.

(c) Position in which it is desired to place Nots What, i.e., whether it is proposed to place Nots What in corners of Ward Room. If so, it should be stated whether corners form right angles. In any case degree of angles should be given.

H.M.S. "Precedent,"

Submitted:

Dec. 2nd, 1915.

The Nots What, two in number, demand No. 16425/F.O., dated Jan. 1st, are required for purpose of receptacles for Trays Ash and Knacks-Knic already supplied for use in Ward Room.

(The dimensions of Ward Room are 20 ft. by 14 ft. by 8 ft.) It is desired to place Nots What, two in number, in opposite diagonal corners (see sketch plan attached). It is regretted that neither of the aforementioned corners form right angles. The corner marked "A" is contiguous to the Intelligence Officer's office, and has become somewhat warped owing to pressure of hot air. The corner marked "B" is near Bugle Boy's pitch, and it is regretted that owing to continual blasts from the ship's

bugle, whereby the stability of the whole structure has been endangered, one side of the angle has been diverted. It is submitted that Bugle Boy's pitch may be moved to the other side in order to correct the deviation from 90 deg.

Hotel Seashell, Room 15,000,

August 2nd, 1916.

The Commanding Officer is informed that the Director in lieu of the Nots What section, will ca'l on Nov. 5th. No car by special request.

Hotel Seashell,

Room 15,000,

Nov. 30th, 1916.

The attention of the Commanding Officer is directed to page 1001, col. 2, lines 25-60 of the interim report on Nots What (copy to be forwarded in due course). Meanwhile, the proposal to remove Bugle Boy's pitch to the N.E. is approved. The angle marked "A" is to be adjusted either by (1) erecting new office, or (2) the Intelligence Officer is to decode signals in the open air. The following particulars are required before Nots What, two in number, can be supplied:—

(a) Colour desired.

(b) Whether curvilinear or rectilinear, i.e., curly or otherwise.

H.M.S. "Precedent,"

Dec. 1st, 1916.

Submitted: Referring to correspondence relating to demand No. 16425/F.O., dated Jan. 1st, 1915, the information required in yours of the 30th ultimo is as follows:—

(a) Colour—red, white and blue.

(b) Shape—curly (facsimile of Harry Lauder's walking stick forwarded as pattern).

Hotel Seashell,

Room 15,000,

Oct., 1917.

The Commanding Officer is informed that Nots What (curly) are no longer issued owing to the increased demands for broom-handles. Nots What are not what they were.

End of War,

(Prize offered for filling in date)

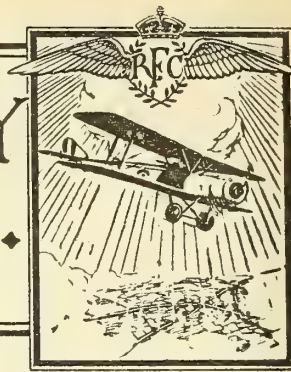
Editor.

Submitted: It is requested that demand No. 16425/F.O., dated Jan. 1st, 1915, may be cancelled as the Nots What two in number, were erected by Naval labour in 1917. Owing to exhaustion of timber supplies the Nots What were built of reinforced concrete after consultation with Director of Works.





# NAVAL *and* MILITARY AERONAUTICS



## FROM THE "LONDON GAZETTE."

ADMIRALTY, Dec. 21st.

R.N.A.S.—Temp. Proby. Flt. Lt. to be temp. Flt. Lt.:—  
H. E. Shaw, Dec. 8th.

WAR OFFICE, Dec. 21st.

REGULAR FORCES—ESTABLISHMENTS—R.F.C.—MIL. WING.  
—Brig. Instrs. in Gunnery.—(Graded as Sqdn. Comdrs.).—  
From Group Instrs. in Gunnery (graded as Flt. Comdrs.), and  
to be temp. Maj. whilst so empld.:—Temp. Capt. C. O. F.  
Modin, D.S.O., Gen. List, Nov. 3rd; Lt. (temp. Capt.) A. P.  
Hartley, Ches. R., T.F., Nov. 4th; Sec. Lt. (temp. Capt.)  
A. P. Davidson, High. L.I., Nov. 5th.

Instrs. in Gunnery.—(Graded as Equipt. Officers, 1st Cl.).—  
And to be temp. Cpts. whilst so empld.:—Temp. Lt. G. K. G.  
Kerr, Gen. List, from a Flying Officer (Obsr.); Lt. G. H. J.  
Mercer, D. of Corn. L.I., from an Asst. Instr. in Gunnery  
(graded as an Equipt. Officer, 2nd Cl.), Dec. 1st.

Adj.—Capt. R. J. H. Purcell, K.R.R.C., and to be secd.,  
Nov. 26th, 1916 (substituted for notification in "Gazette" of  
Jan. 3rd).

\* \* \*

The "London Gazette" of Dec. 21st announces that, acting  
under the powers conferred by section 8 of the Air Force Act,  
the King has made an Order in Council, setting forth the con-  
stitution of the Air Council. The Order also provides for the  
manner in which the various members of the Council shall be  
appointed and for the allocation among them of the business  
which will have to be dealt with. The text of the Order is as  
follows:—

1. As from such date as His Majesty may hereafter fix by  
Order in Council as the date on which the Air Council is to be  
established, the Air Council shall consist of the following mem-  
bers, that is to say:—

- One of His Majesty's Principal Secretaries of State who  
shall be President of the Air Council;
- The Chief of the Air Staff;
- The Deputy Chief of the Air Staff;
- The Master General of Personnel;
- The Controller General of Equipment;
- The Director General of Aircraft Production in the Ministry  
of Munitions;
- The Administrator of Works and Buildings;
- The Parliamentary Under Secretary of State;
- Two additional Members.

2. The members of the Air Council (other than the Presi-  
dent) the Chief of the Air Staff, the Deputy Chief of the Air  
Staff, the Master General of Personnel, the Controller General  
of Equipment, and the Inspector General of the Air Force, shall  
be appointed by His Majesty; the Director General of Aircraft  
Production shall be appointed by the Minister of Munitions, and  
the other members of the Air Council shall be appointed by the  
Secretary of State.

3. The Secretary of State is to be responsible to His Majesty  
and Parliament for all the business of the Air Council.

All business, other than business which the Secretary of State  
specially reserves to himself, is to be transacted in the following  
principal divisions:—

(a) The Chief of the Air Staff, the Master General of Per-  
sonnel, and the Controller General of Equipment to be respon-  
sible to the Secretary of State for the administration of so  
much of the business relating to the organisation, disposition,  
*personnel*, equipment, armament and maintenance of the Air  
Force as may be assigned to them or each of them from time  
to time by the Secretary of State.

(b) The Deputy Chief of the Air Staff to be responsible for  
the administration of so much of the business assigned to  
the Chief of the Air Staff as may be delegated to him by the  
Chief of the Air Staff.

(c) The Parliamentary Under Secretary of State to be  
responsible to the Secretary of State for the finance and con-  
tracts of the Air Force, for the acquisition and administration

of lands required for the purposes of the Air Force, and for  
so much of the other business of the Air Council as may be  
assigned to him from time to time by the Secretary of State.

(d) The Administrator of Works and Buildings to be respon-  
sible to the Secretary of State for the provision and maintenance  
of the works and buildings required for the Air Force.

(e) The Secretary of the Air Council to be charged with the  
interior economy of the Department and the preparation of  
all official communications of the Council, and with such other  
duties as the Secretary of State may from time to time assign  
to him.

4. Subject to the foregoing provisions as to the transaction  
of business in separate divisions, the powers and duties of the  
Air Council may be exercised and performed by any three of  
their number, and notwithstanding that any office the holder of  
which is a member of the Air Council is temporarily vacant.

WAR OFFICE, Dec. 22nd.

REGULAR FORCES—ESTABLISHMENTS—R.F.C.—MIL. WING.  
—Adj.—Lt. C. C. Webb, Leic. R., T.F., from an Equipt.  
Officer, 3rd Cl., and to be temp. Capt. (with pay and allowances  
as Lt.) whilst so empld., Oct. 18th.

SCHOOLS OF INSTRN.—SCHOOLS OF MIL. AERONAUTICS.—Asst.  
Instrs.—(Graded as Equipt. Officers, 2nd Cl.).—Temp. Lt. F. B.  
Luget, Gen. List, an Equipt. Officer, 2nd Cl., Nov. 13th; Lt.  
G. R. Spencer, Lanc. Fus., Spec. Res., reverts to Flying Officer  
(Obsr.), Sept. 21st.

WAR OFFICE, Dec. 24th.

REGULAR FORCES—ESTABLISHMENTS—R.F.C.—MIL. WING.  
—Flt. Comdrs.—From Flying Officers, and to be temp. Cpts.  
whilst so empld.:—Temp. Sec. Lt. (temp. Lt.) R. E. Bryson,  
attd. Scot. Rif., and to be transfd. to R.F.C. Gen. List,  
Dec. 3rd; Sec. Lt. (temp. Lt.) A. J. Brown, R. Huss. R., T.F.,  
Dec. 6th. The surname of Capt. W. Smith, M.C., Lond. R.,  
T.F., is as now described, and not as in the "Gazette" of  
Sept. 20th.

Special Appt.—(Graded as a Flt. Comdr.).—Temp. Sec. Lt.  
(temp. Lt.) W. A. Dunn, Gen. List, a Balloon Comdr., and to  
be temp. Capt. while so empld., Nov. 1st.

Adj.—The appt. of Capt. E. W. Forbes, M.C., R. War. R.,  
T.F., notified in "Gazette" of Nov. 21st, is antedated to Aug.  
16th.

Park Comdr.—Ormr. and Hon. Lt. (temp. Lt.-Col.) J. H.  
Wilford, from a Comdt. of a School of Technical Training  
(graded as a Depot Comdr.), relinquishes his temp. rank and to  
be temp. Maj. whilst so empld., Dec. 7th, seny. Oct. 10th,  
1916.

Equipt. Officers, 1st Cl.—Lt. F. G. M. Williams, Spec. Res.,  
from the 2nd Cl., and to be temp. Capt. whilst so empld.,  
Sept. 16th.

SCHOOLS OF INSTRN.—SCHOOL OF BOMBING.—Instr.—Graded as  
an Equipt. Officer, 2nd Cl.—Temp. Sec. Lt. (on prob.) W.  
Moulding, Gen. List, to be confirmed in his rank, and to be temp.  
Lt. whilst so empld., Oct. 16th.

Gen. List.—Temp. Capt. S. Clare, Garr. Bn., Cam'n Highrs.,  
to be transfd. to R.F.C., Gen. List, Aug. 11th.

ADMIRALTY, Dec. 31st.

The King has been pleased to give directions for the following  
appointment to the Most Distinguished Order of Saint Michael  
and Saint George, in recognition of valuable services rendered  
during the War:—

C.M.G.

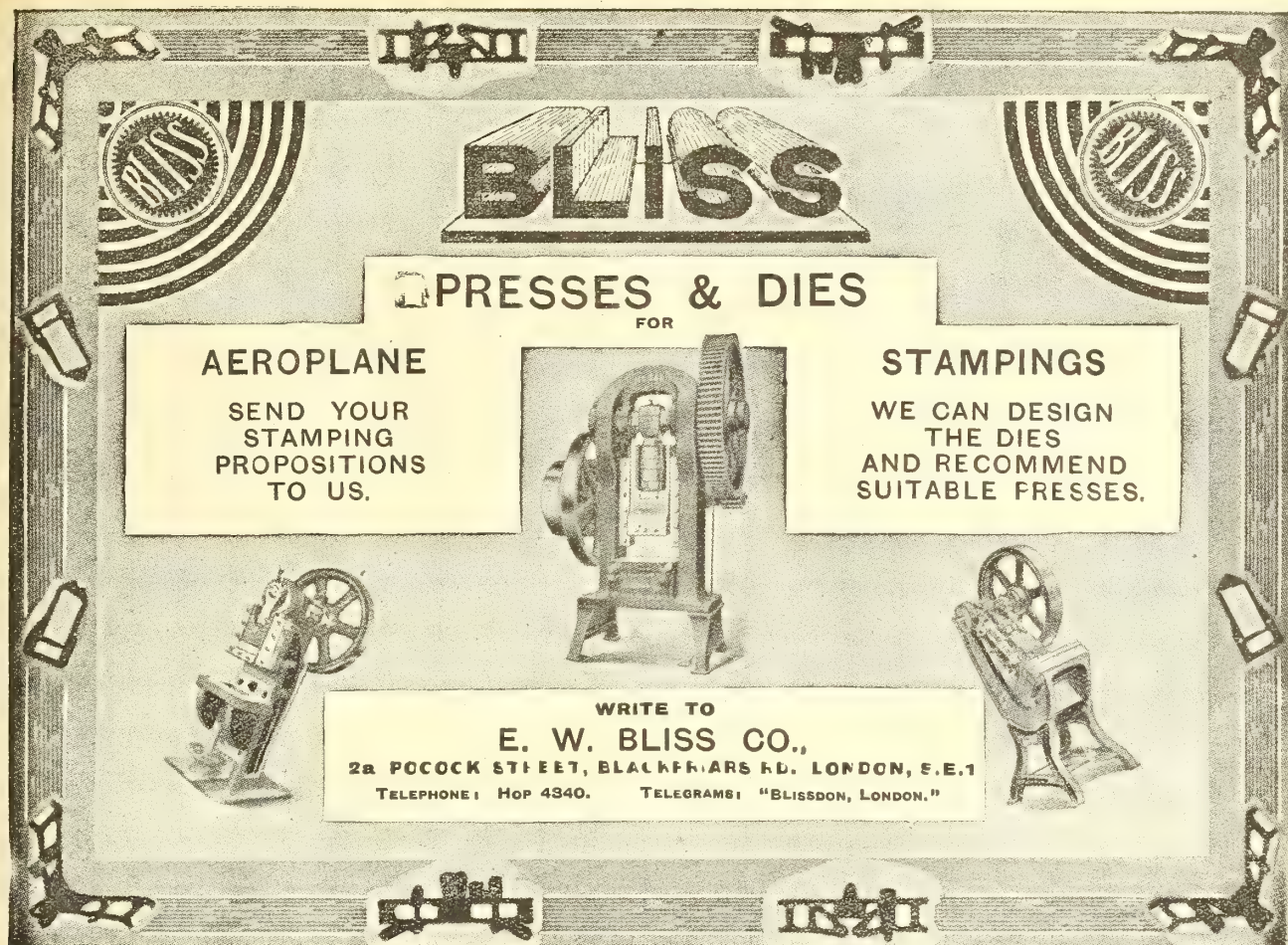
Capt. CHARLES LAVEROCK LAMBE, R.N., D.S.O.

The King has been pleased to give orders for the appointment  
of the following Officers to be Companions of the Distinguished  
Service Order, in recognition of their services in the prosecution  
of the War:—

Wing Comdr. PEREGRINE FORBES MORANT FELLOWES, R.N.  
Flt. Comdr. ALEXANDER MACDONALD SHOOK, D.S.C., R.N.A.S.

[The Special R.N.A.S. Promotions under date Dec. 31st appear  
in their proper place at the end of the Special Promotions in the  
Naval Honours for 1917 printed elsewhere.—Ed.]





**BLISS**

**PRESSES & DIES**

FOR

**AEROPLANE**

SEND YOUR  
STAMPING  
PROPOSITIONS  
TO US.



**STAMPINGS**

WE CAN DESIGN  
THE DIES  
AND RECOMMEND  
SUITABLE PRESSES.

WRITE TO  
**E. W. BLISS CO.,**  
22 POCKOCK STREET, BLACKFRIARS RD. LONDON, E.C.4  
TELEPHONE: HOP 4340. TELEGRAMS: "BLISSDON, LONDON."



# Magnetos

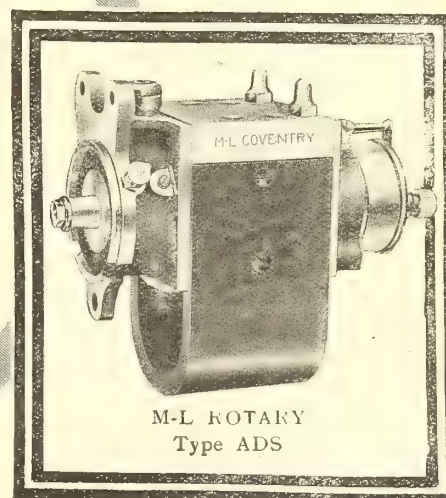
*Smaller; Lighter;  
More Efficient.*

*All-British*

**M-L** Magnetos are of British design and built by British labour in a British owned factory. They have been supplied in large numbers for work of national importance. They are waterproof; always start easily and are efficient at the highest possible speeds.

The M-L Magneto, Type ADS is designed for use on rotary or other engines in which the distributor is carried on the engine itself and does not form a part of the magneto. It is fitted with an "H" armature and gives two sparks per revolution.

*At Your Service  
after the War.*



**The M-L Magneto Synd., Ltd.,**  
**Victoria Works - Coventry.**  
*Members of the British Ignition  
Apparatus Association.*

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



The King has been pleased to give orders for the following appointment to the Most Honourable Order of the Bath for valuable services rendered in connection with military operations in the Field (dated Jan. 1st, 1918):—

K.C.B. (MILITARY DIVISION).

Maj.-Gen. HUGH MONTAGUE TRENCHARD, C.B., D.S.O.

\* \* \*

The King has been pleased to give directions for the following appointment to the Most Distinguished Order of Saint Michael and Saint George, for services rendered in connection with Military Operations in the Field (dated Jan. 1st, 1918):—

C.M.G.

Maj. and Bt. Lt.-Col. (temp. Brig.-Gen.) TOM INCE WEBB-BOWEN, Bedford. R.

\* \* \*

The King has been pleased to give directions for the following appointments to the Most Distinguished Order of Saint Michael and Saint George, in recognition of valuable services in connection with the War (dated Jan. 1st, 1918):—

C.M.G.

Maj. and Bt. Lt.-Col. (temp. Brig.-Gen.) DUNCAN LE GEYT PITCHER, Ind. A.

Lt.-Col. (temp. Col.) FREDERICK LINDSAY LLOYD, ret. pay, R. of O. Maj. (temp. Lt.-Col.) JAMES GEORGE WEIR, R.F.A.

Capt. (temp. Col.) CECIL HENRY WHITTINGTON, R.F.C., S.R.

\* \* \*

The King has been graciously pleased to approve of the following rewards for distinguished service in the Field (dated Jan. 1st, 1918):—

TO BE BREVET COLONEL.

Brig.-Gen. E. L. ELLINGTON, C.M.G., R.A.

Brig.-Gen. J. F. A. HIGGINS, D.S.O., R.A.

Brig.-Gen. J. H. W. BECKE, D.S.O., Notts. and Derby R. and R.F.C.

Brig.-Gen. G. S. SHEPARD, D.S.O., M.C., R. Fus.

TO BE BREVET MAJOR.

Lt.-Col. E. H. DAVIDSON, M.C., Gord. Highrs. and R.F.C.

Lt.-Col. G. F. PRETYMAN, D.S.O., Som. L.I., attd. R.F.C.

\* \* \*

The King has been pleased to approve of the following Honours and Rewards for valuable services rendered in connection with the War (dated Jan. 1st, 1918):—

TO BE Bt. LT.-COL.

Brig.-Gen. T. C. R. HIGGINS, R. Lan. R.

Brig.-Gen. R. E. T. HOGG, C.I.E., I.A. and R.F.C.

Brig.-Gen. G. LIVINGSTON, C.M.G., Lond. R. and R.F.C.

TO BE Bt. MAJOR.

Lt.-Col. U. J. D. BOURKE, Oxf. and Bucks. L.I. and R.F.C.

Capt. J. F. DYER, E. Lancs. R. and R.F.C.

Lt.-Col. B. S. FOSTER, Hamps. R. and R.F.C.

Lt.-Col. A. HUGGINS, D.S.O., R.F.C., Spec. Res.

Brig.-Gen. F. C. JENKINS, R.F.C., Spec. Res.

Capt. Sir N. R. A. D. LESLIE, Bt., Ind. Cav. and R.F.C.

Capt. G. D. PIDGEON, R.F.C., Spec. Res.

Lt.-Col. R. R. SMITH-BARRY, R.F.C., Spec. Res.

TO BE HONORARY MAJOR.

Lt.-Col. F. H. KIRBY, V.C., R.F.C.

## FROM THE COURT CIRCULAR.

BUCKINGHAM PALACE, Dec. 21st.

The Lord Rothermere (President of the Air Board) was sworn in as a Member of the King's Most Honourable Privy Council.

## NAVAL.

The following appointment has been made in the Royal Naval Air Service:—

DEC. 25th.—Third Wtr. G. Bell granted a temp. commission as lieutenant, R.N.V.R., with seniority Dec. 16th.

DEC. 29th.—Capt. (R.M.A.)—J. H. D'Albiac, D.S.C., graded as Proby. Flt. Lt. (temp.), seny. Dec. 31st.

DEC. 31st.—The following Lt., R.N., has been promoted to rank of Lt. Comdr., R.N., D. A. Oliver, D.S.O. (Temp. Wing Comdr.).

## ADMIRALTY COMMUNIQUE.

DEC. 23rd.—During the night of Dec. 22nd and 23rd, naval aircraft carried out bombing raids on the following enemy aerodromes:—

St. Denis Westrem, Mariakerke, Oostacker.

Visibility was excellent, and good shooting was made on all three aerodromes. In all about six tons of bombs were dropped.

All our machines returned safely.

DEC. 25th.—During the night of Dec. 23rd and 24th bombing raids by naval aircraft were carried out on the following objectives:—

Bruges Docks.

Enemy aerodromes at St. Denis Westrem and Ghisteltes.

About three tons of explosives were dropped on the Docks; and about one and a half tons on the two aerodromes.

All machines returned safely.

The Secretary of the Admiralty announced on Dec. 24th that it has been decided that officers (other than officers of the Royal Navy, Royal Navy Reserve, Army, or Royal Marines), who are graded as observer officers in the Royal Naval Air Service, shall wear the uniform of their rank in the military branch of the Royal Navy, except that the anchor on buttons, cap-badge, epaulettes, and sword belt will be replaced by a gilt badge, consisting of an "O" with wings, and shall wear in addition an "O" with wings on each sleeve above the distinction lace, and on each shoulder strap.

The distinction marks of rank on the sleeve and shoulder-strap for observer officers will be as follows:—

Observer captain holding the rank of captain in the Royal Navy.—As for a captain in the Royal Navy.

Other observer captains.—As for a commander in the Royal Navy, with the addition of a star above the "O" with wings.

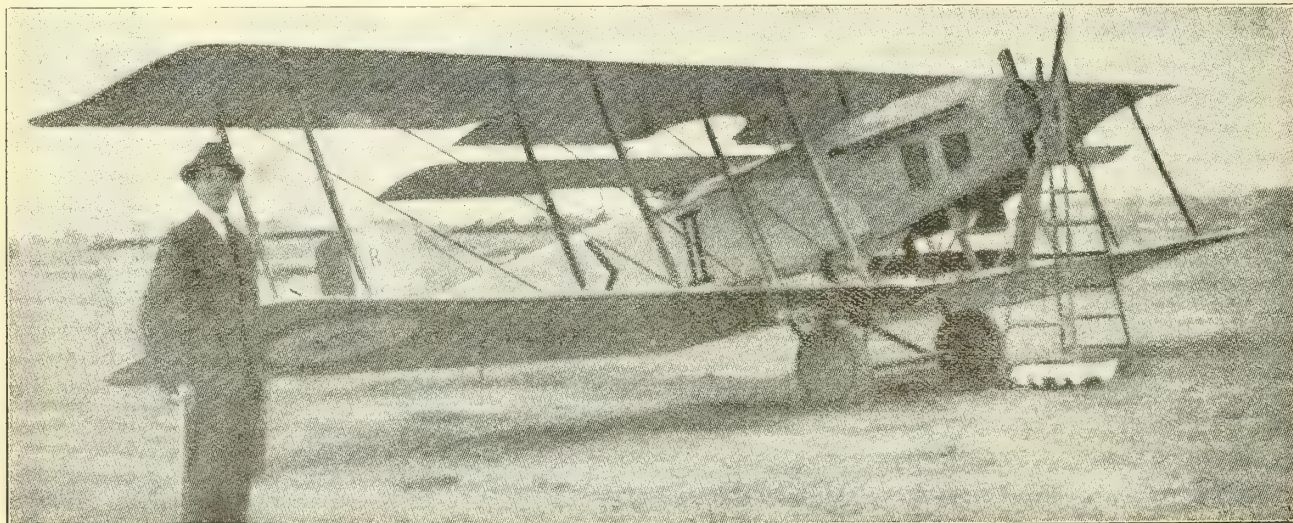
Wing observer.—As for a commander in the Royal Navy.

Squadron observer of eight years' seniority as observer lieutenant, flight observer, and squadron observer.—As for a lieutenant-commander in the Royal Navy.

Squadron observer of less than eight years' seniority as observer lieutenant, flight observer, and squadron observer.—As for a lieutenant in the Royal Navy, with the addition of two stars above the "O" with wings.

Flight observer.—As for a lieutenant in the Royal Navy, with the addition of a star above the "O" with wings.

Observer lieutenant.—As for lieutenant in the Royal Navy.



A Bréguet Biplane, of the 1917 Vintage.

(From a French Official Photograph.)



# OFFICIAL ACCEPTANCE TESTS

## LAND MACHINES.

Handley-Page Avro  
S.P.A.D. Blackburn  
Sopwith Armstrong-  
B.E. Whitworth  
Short D. H. 4.  
Curtiss Bristol  
Mann, Egerton Vickers  
M. Farman Nieuport  
H. Farman Supermarine, &c  
Morane

## SEAPLANES.

Short, Sopwith, America Boats,  
F.B.A. Boats, Curtiss Boats,  
Norman-Thompson and A. D.  
Boats, &c.

*Private Aerodromes  
Surveyed and Pilots'  
Reports Furnished.*

## DELIVERY AND EXPERIMENTAL FLIGHTS

ON LAND MACHINES & SEAPLANES.

COMPLETE REPORTS FURNISHED.

*Rates on application to*

THE  
**PRODGER - ISAAC**  
AVIATION COMPANY  
(C. B. Prodger and Bernard Isaac),  
166, Piccadilly, London, W.1.

Telephone: Gerrard 278 (2 lines.)  
Telegrams: "Aeromnla, Piccy, London."

## CLIFFORD B. PRODGER,

J. LANKESTER-PARKER,  
and other Pilots.

Approved Admiralty Pilots  
— for Acceptance Trials. —

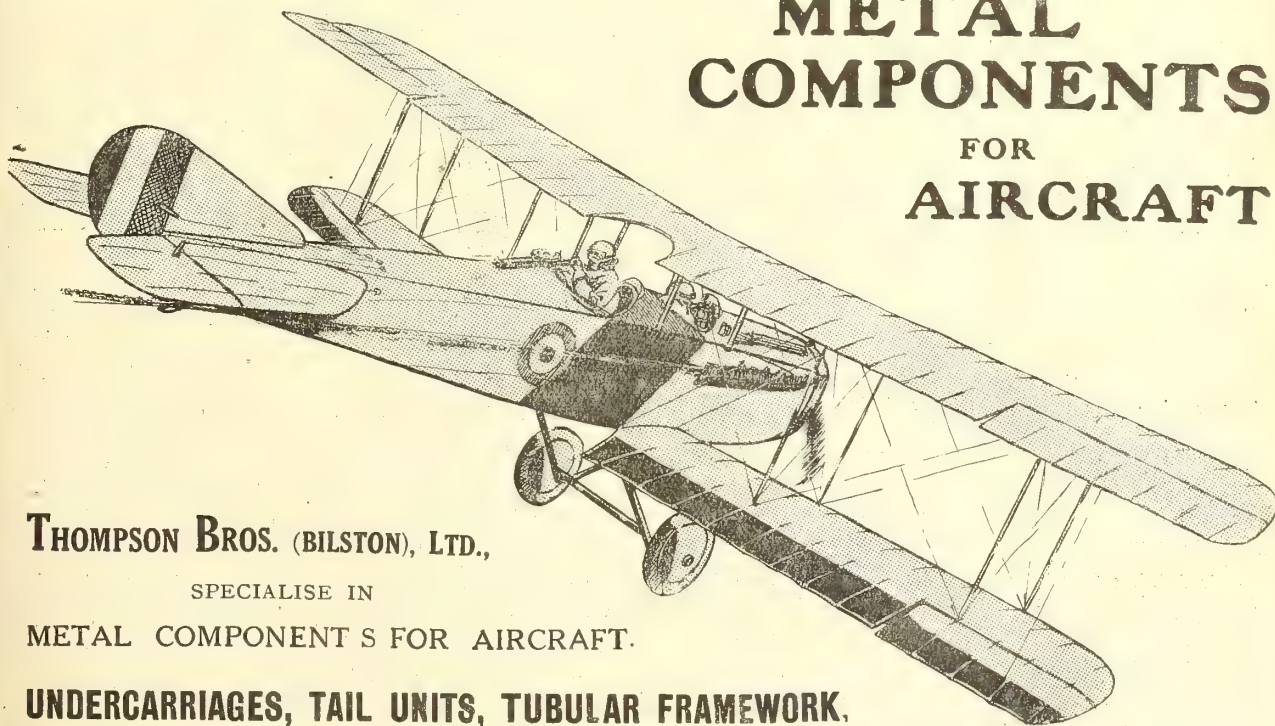
## INSURANCE.

WE are now in a position to quote low rates, through our brokers at Lloyd's, for the Insurance of Aircraft during ACCEPTANCE TRIALS AND DELIVERY FLIGHTS with an excellent and most comprehensive Policy. May we quote you for your new contracts?

**SPECIAL ARRANGEMENTS with Sub-Contractors for HANDLEY-PAGE Type Land Machines and "AMERICA" Type Flying Boats.**

Geo. Webster, Advertising Service.

## METAL COMPONENTS FOR AIRCRAFT



**THOMPSON BROS. (BILSTON), LTD.,**

SPECIALISE IN  
METAL COMPONENTS FOR AIRCRAFT.

UNDERCARRIAGES, TAIL UNITS, TUBULAR FRAMEWORK.

**THOMPSON BROS. (BILSTON), LTD., AERO. DEPT., BILSTON, STAFFS.**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

Observer sub-lieutenant.—As for a sub-lieutenant in the Royal Navy.

Effect need not be given to the change promulgated in the opening paragraph until the articles of uniform require renewal.

#### THE CASUALTY LIST.

Reported Dec. 24th.

**DIED OF INJURIES.**—Gorman, Flt. Lt. J., R.N.  
**PREVIOUSLY REPORTED MISSING, BELIEVED DROWNED, NOW REPORTED DROWNED.**—Odle, Obsr. Sub-Lt. H., R.N.  
**MISSING.**—Richardson, Flt. Sub-Lt. S. S., R.N.  
**SLIGHTLY INJURED.**—Morell, Flt. Sub-Lt. J. A., R.N.  
 Cooper, Prob. Flt. Officer G. W., R.N.

Reported Dec. 28th.

**DIED OF WOUNDS.**—Jones, G. H., Off. Stwd., 2nd Cl., L.8772.

Reported Dec. 29th.

**KILLED.**—Wright, Flt. Sub-Lt. D. R. C., R.N.  
**ACCIDENTALLY KILLED.**—Littleboy, Flt. Sub-Lt. V. H., R.N.  
 Swallow, Flt. Sub-Lt. R., R.N.  
**DIED OF INJURIES.**—Greeves, Flt. Sub-Lt. T. M., R.N.  
**MISSING (FEARED KILLED).**—Horner, Flt. Comdr. (acting Lt., R.N.) W. F., R.N.  
**MISSING (FEARED DROWNED).**—Cressman, Flt. Sub-Lt. F. C., R.N.  
**ACCIDENTALLY INJURED.**—Watson, Flt. Lt. V. A., R.N.  
 Cave, Lt. E. R. O., R.N.V.R.

#### PERSONAL NOTICES.

##### DEATHS.

**HORNER.**—Flt. Comdr. (Actg. Lt., R.N.), William Frith Horner, R.N., who was drowned at sea whilst on active service on the night of Dec. 21st, was the only son of Leonard and Annie Marion Horner, of Wayside, Warlingham, Surrey, and grandson of Isaline Marion Blew, of the same address. He was 22 years of age.

**LITTLEBOY.**—Flt. Sub-Lt. Vernon Hatherton Littleboy, R.N., who was accidentally killed whilst flying on Dec. 22nd, was the son of Mrs. J. Littleboy, of Woking. He was 22 years of age.

##### MARRIAGE.

**TAIT—SPARKES.**—On Dec. 31st, at Holy Trinity, Sloane Street, William Monsell Tait, R.N.A.S., was married to Sybil Margaret Sparkes, by the Rev. A. Crick.

##### BIRTH.

**NICHOLL.**—On Dec. 27th, at 55, Welbeck Street, W., the wife of Sqdn. Comdr. Nicholl, D.S.C., R.N., of a daughter.

Flt. Sub-Lt. William E. Foster, R.N., youngest son of Mr. Robert Foster and the late Hon. Mrs. Robert Foster, of Stockeld Park, Wetherby, Yorkshire, who was reported missing on Sept. 4th, and was later officially reported prisoner of war in the hands of the Turks, has written that he is in good health and being well treated.

Four drivers in the Royal Naval Air Service were committed for trial at Marylebone on Dec. 21st on a charge of conspiring to steal Government property, consisting of magnetos, dynamos, etc., worth £500.

#### MILITARY.

##### G.H.Q. COMMUNIQUÉS.

**Dec. 23rd, 9.30 p.m.**—On the 2nd inst., when the haze had cleared, our aeroplanes carried out artillery work and took photographs of the enemy front and back areas.

Bombs were dropped on a big gun near Lille and on other targets, including hostile hutments, billets, and trenches. The enemy's infantry were also engaged in their trenches with machine-gun fire, many thousands of rounds being fired by our pilots.

In air fighting four hostile machines were brought down.

As soon as it was dark our aeroplanes showed greatest activity, bombing the aerodromes of the enemy's night-flying squadrons, as well as important railway stations where activity was observed. In spite of the intense cold several of our pilots made two consecutive flights to one of the enemy's aerodromes, where many hits were obtained on the sheds.

All our machines returned.

**Dec. 24th, 9.35 p.m.**—On the 23rd inst. a dense haze made little work possible in the air, except bombing and fighting, both of which were carried on with the utmost vigour. The enemy's artillery machines were very active, and five were brought down in air fighting, three of them falling in our lines. Two other hostile machines were brought down in our lines by anti-aircraft gunfire. One of these latter was a large twin-

engined machine with three occupants, who were taken prisoner. After dark a thick mist set in which did not lift till the early morning. Our night-flying machines then left the ground and bombed several of the enemy's aerodromes with good effect.

In daylight on the 24th inst. one of our squadrons bombed Mannheim-on-the-Rhine with excellent results. A ton of bombs was dropped, and bursts were observed in the large main station, in the works, and also in the town, where fires were started.

Very heavy anti-aircraft gunfire was directed against our aeroplanes when over their objective, and one of our machines was damaged and forced to land. Several of the enemy's scouts made repeated attacks on our formations, but were driven off.

All of our machines returned, with the exception of the one machine mentioned above.

**Dec. 27th, 9.15 p.m.**—On the 26th inst. a certain amount of flying was done between the snowstorms. Photographs were taken, a few bombs dropped on various targets, and many rounds fired into the enemy's trenches. One hostile machine was brought down.

During the night a few machines took advantage of a short fine spell and dropped bombs on the enemy's billets close to the lines.

None of our machines is missing.

**Dec. 28th, 9.26 p.m.**—On the 27th inst. snowstorms again made it impossible to do much flying. A hostile scout machine was brought down in our lines and the pilot captured.

During the night of the 27th-28th inst. our aeroplanes dropped 240 bombs on four of the enemy's aerodromes round Roulers, and on hostile billets south of Lille. Several trains were also bombed by us, and a direct hit was obtained on one of them.

None of our machines is missing.

**Dec. 29th, 9.13 p.m.**—On the 28th inst. the weather was fine with a strong east wind, which late in the afternoon increased almost to a gale. A great many successful photographs were taken by our aeroplanes, and over a hundred bombs were dropped on three of the enemy's aerodromes north of Lille.

The enemy's artillery machines were very active, and were repeatedly attacked by our scouts and engaged by our anti-aircraft guns.

Seven hostile machines, four of which fell in our lines, were brought down by our aeroplanes, and two others were driven down out of control. Four other hostile machines were shot down by our anti-aircraft guns, three of them falling in our lines.

Three of our aeroplanes are missing.

**Dec. 30th, 10.3 p.m.**—Although the weather was fine on the 29th inst., visibility was bad, and greatly interfered with the co-operation of our aeroplanes and artillery. Much successful photographic work was accomplished, however, and many bombs were dropped on Ingelmunster aerodrome and Staden and other hostile billets.

Two hostile machines were brought down in our lines and a third in the enemy's lines. Two other hostile machines were driven down out of control.

None of our aeroplanes is missing.

##### WAR OFFICE COMMUNIQUÉS.

**Dec. 21st.**—The G.O.C. the British Forces in Mesopotamia reports:—

Our aeroplanes have been active, and have bombarded with success the Turkish aerodromes at Tuz Khurmatli (on the Bagdad-Mosul road beyond Kifri) and in the vicinity of the junction of the Lesser Zab with the Tigris (50 miles north of Tekrit).

Heavy rain fell during Dec. 20th.

**Dec. 23rd.**—The G.O.C. the British Forces in Palestine reports:—

Two and a half tons of bombs were dropped on the retreating enemy troops, causing many casualties, also on rolling stock and transport with good effect.

Six thousand rounds were also fired from machine-guns at the enemy's column at short range.

One enemy machine was driven down.

After two days of rain the weather on the 22nd had become very clear.

**Dec. 24th.**—The G.O.C. the British Forces in Italy reports that since the date when a portion of the Italian front was taken over by the troops under his command:—

Our aviators have given a good account of themselves, but have been hampered by unfavourable weather during the last few days.

**Dec. 27th.**—The G.O.C. the British Forces in Italy reports:—

Yesterday enemy aeroplanes made a determined bombing attack on an aerodrome used by the British R.F.C. Squadron, apparently, from prisoners' statements, in retaliation for a recent successful British aeroplane attack on an enemy leave train, which caused many casualties to officers and men.

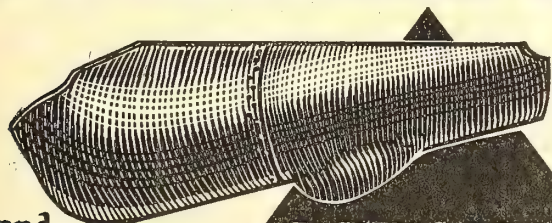


The All  British**Standard** **LIGHT CAR**

The Standard Motor Co., Ltd., Coventry.

London Agents: The Pychley Autocar Car Co., Ltd., 216, Gt. Portland Street, W.

# UNDER SHIELDS

and  
other light  
Pressed and  
Stamped Work  
in Steel and  
Aluminium**JOSEPH SANKEY  
& SONS, LTD.**Hadley Castle Works  
Wellington  
Shropshire

FOR

**AEROPLANES****Where Flying Men are fitted out.**

## Kit for all Services

**E**VERY airman, from the wrecking "Hun" to the accomplished Stunt Pilot; from the occupant of the "Blimp" to his brother in the "Rupert"; has the word "Kit" fixed pretty firmly in his mind. And small wonder, since the air is an opponent a long way more dangerous than Fritz's circuses—and a sticker at that.

To obtain reliable kit—Dunhill Kit—should be the airman's first consideration. At Dunhills he is assured of quality, both in material and cut; of garments practical and reliable; of that service that can only be given by outfitters who specialise in air kit. Dunhills have studied aviation out-

fitting since the first 'plane hopped. In common with flying their business has developed, until, to-day, they stand, pre-eminently the house for true value.

Tunic, in finest whipcord,  
**£5 10s.**Breeches, best Bedford cord  
**£3 3s.**Leather Coats, made of  
finest chrome dressed skin,  
light in weight, soft to  
handle, fitting like a glove,  
lined with finest fleece, in  
light shade of leather,  
**£9 9s.**In tan or black,  
**£10 10s.**

The Aviation Catalogue  
gives the rest of the Kit,  
and a copy will be sent  
gladly on request.

# Dunhill's

LIMITED,

2, Conduit Street, London, W. 1.

MANCHESTER:  
90 and 92, Cross Street.GLASGOW:  
72, St. Vincent Street.



So successful were British and Italian anti-aircraft defences and our own fighting machines, that at least five of the enemy machines were destroyed, and later reports may prove even more. Damage to aerodrome very slight and our losses nil.

DEC. 28th.—The G.O.C. the British Forces in Palestine reports:—

The Royal Flying Corps effectively attacked in the vicinity of Kulundia (six miles north of Jerusalem) enemy troops and transport with bombs and machine-gun fire.

DEC. 29th.—The G.O.C. the British Forces in Palestine reports:—

Our aeroplanes bombed troops and transport on the Nablus road all day on the 28th with great effect.

DEC. 29th.—The G.O.C. the British Forces in Palestine reports:—

Enemy troops and transport in the neighbourhood of Jufna, Beitin (Bethel), and El Bafua (all on or near the roads leading northwards from Bireh) were successfully bombed and machine-gunned by the Royal Flying Corps.

#### HOME COMMAND COMMUNIQUÉS.

DEC. 22nd, 10.30 p.m.—An air raid was attempted on the Kentish coast shortly after 6 p.m. One raider was forced to descend close to the coast, the crew of three being captured alive. No other machines came over the land at this time.

A second attack developed about 9.30 p.m., when a few bombs were dropped in Thanet.

The raiders did not penetrate farther inland.

\* \* \*

An official announcement issued at 11.20 a.m. on Dec. 23rd stated that no casualties or damage occurred in the air raid on Dec. 22nd.

The Secretary of the War Office makes the following announcement:—

DEC. 30th.—The following further information about the bombing raid on Mannheim carried out on Dec. 24th has now been received:—

Two of our formations totalling 10 machines crossed the line at a height of 9,000ft. between 10 and 10.15 a.m. The two formations arrived over the objective almost simultaneously, and, in spite of heavy and accurate anti-aircraft fire, dropped their bombs from a height of over 13,000ft.

Sixteen 112lb. bombs and two 230lb. bombs were dropped in all, four bursts being observed in the main station, several in the Lanz works, two in Ludwigshafen, and several in the munitions factory between Mundenheim and Rhingonnheim, bursts being partially confirmed by photographs taken at the time.

Two formations of enemy aeroplanes were encountered, totalling 11 machines, of which, however, only five reached the height of the bombing machines, and these did not attempt to attack at close range.

The anti-aircraft defences around Mannheim appeared strong, and brought down one of our machines, which was last descending under control. In addition, one of our observers was wounded, but reached home safely.

Haze and mist added to the difficulties of the operation, some towns in the Rhine Valley being completely covered.

#### THE CASUALTY LIST.

Reported Dec 22nd.

KILLED.—Kirkpatrick, Lt. J. C., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Ingles, Sec. Lt. W. L., R. Sco. Fus., attd. R.F.C.

DIED OF WOUNDS.—Corry, Sec. Lt. E. M., Sher. For., attd. R.F.C.

WOUNDED.—Harmer, Sec. Lt. W. T. V., Sea. Highrs., attd. R.F.C.

Jepp, Sec. Lt. F. A., R.F.C.

MISSING.—Honeyman, Sec. Lt. H. T. A., R. Sco. Fus., attd. R.F.C.

Malcolmson, Capt. T. S., R.F.A., attd. R.F.C.

Thierry, Sec. Lt. L. H., R.F.C.

AUSTRALIAN FORCE.—ACCIDENTALLY KILLED.—Scott, Lt. W. N. E., F. C.

Storrer, Capt. H. H., F. C.

Reported Dec. 26th.

DIED OF WOUNDS.—Ross, Sec. Lt. A., R. Sco. Fus., attd. R.F.C.

WOUNDED.—Thomas, Sec. Lt. B., R.F.C.

Turner, Lt. M. W., R.G.A. and R.F.C.

Reported Dec. 29th.

KILLED.—Hunter, Capt. T. V., Rif. Brig., attd. R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Bell, Sec. Lt. N., Ches. R., attd. R.F.C.

Smith, Capt. G. K., M.C., R.F.C.

Young, Sec. Lt. H. F., Sher. For., attd. R.F.C.

WOUNDED.—Burns, Sec. Lt. A. H., R.F.C.

Scott, Sec. Lt. T. R., R.F.C.

Sloan, Capt. L. H. T., Cam'n Highrs., attd. R.F.C.

Steele, Sec. Lt. T. L., R.F.C.

PREVIOUSLY REPORTED PRISONER, NOW REPORTED WOUNDED AND PRISONER IN GERMAN HANDS.—Atkinson, Lt. J. M., A.S.C., attd. R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN GERMAN HANDS.—Cribb, Sec. Lt. A. G., R.F.C.

Gordon, Lt. E. G. S., R.F.C.

Rush, Sec. Lt. A. W., R.F.C.

CANADIAN FORCES.—PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED OR DIED OF WOUNDS.—Carter, Lt. R. B., Alta. Regt., attd. R.F.C.

Sawlor, Lt. R. H., N.B. Regt., attd. R.F.C.

WOUNDED.—McKinnon, Capt. H. B., Cent. Ont. R., attd. R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER IN GERMAN HANDS.—Morse, Lt. T. W., Cent. Ont. R., attd. R.F.C.

Reported Dec. 31st.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—

Chapman, Sec. Lt. A. J., R.F.C.

Dutton, Sec. Lt. R., R.F.C.

Ellis, Lt. R. W., R.F.C.

Ingles, Sec. Lt. R. A., R.F.C.

Kirby, Sec. Lt. F. W., R.F.C.

PREVIOUSLY REPORTED WOUNDED, NOW REPORTED DIED OF WOUNDS.—Rowles, Lt. S. W., A.S.C., attd. R.F.C.

WOUNDED.—Cooper, Sec. Lt. J. H., Arg. and Suthd. Highrs., attd. R.F.C.

MISSING.—Caunt, Sec. Lt. H. V., W. Yorks R., attd. R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN GERMAN HANDS.—Atkinson, Sec. Lt. T. L., R.F.C.

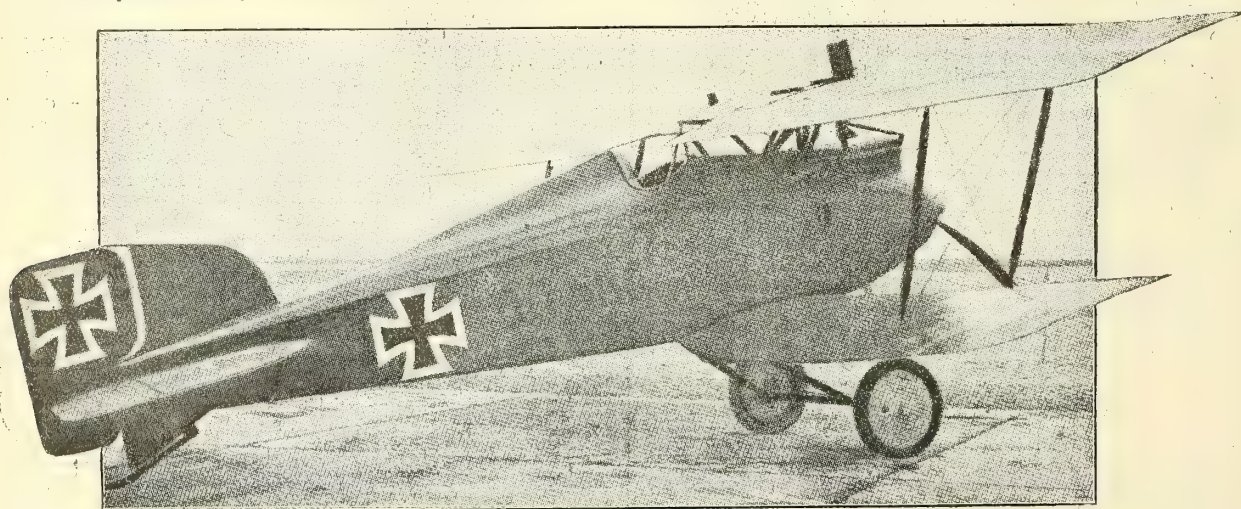
Cutbill, Sec. Lt. E. H., R.F.C.

Kent, Sec. Lt. T. J., R.F.C.

Pruden, Sec. Lt. W. C., R.F.C.

Stead, Sec. Lt. M. W. B., R.F.C.

Wilmot, Capt. E. P., M.C., R.F.C.



The Friedrichshafen Single-seater Fighting Biplane, built by a branch of the Zeppelin Company. This type seems to have been deleted recently, owing to the works having been turned on to build the "Riesenflugzeug," or Giant Aeroplane type.



# ALUMINIUM CASTINGS



SAND or DIE  
of Every Description  
2 HP to 600 HP

Telephones  
3846  
CITY  
4879  
CENTRAL

CHILL CASTINGS for AEROPLANES A SPECIALITY  
Best Metal. Good Castings. Quick Deliveries  
Repairs to Aluminium Crank Cases, Gear Boxes etc. by Special Process.

Telegrams  
KRANKASES  
ISLING  
LONDON

## R.W.COAN

The Aluminium Foundry  
219, GOSWELL ROAD,  
LONDON.  
E.C

COAN  
CASTS  
CLEAN  
CRANK  
CASES

Contractor  
to  
H.M GOVERNMENT

NOW IN A POSITION TO EXECUTE ORDERS.

Telephone:—1992 HAMMERSMITH (3 lines).

The  
**DAVIDSON**  
Aviation Co Ltd

CONTRACTORS TO H.M. GOVERNMENT.

Designers and Manufacturers of all Types  
of Aircraft for Overland and Oversea  
- - Purposes, Flying Boats, etc. - -

Managing Director:  
W. EWART CHESTER, F.R.G.S.

Consulting Engineer:  
H. B. MOLESWORTH, M.I.C.E.

Aviation Works & Offices - 229-231, Hammersmith Road, W.  
Engineering Works - King Street, Hammersmith,  
Aircscrew Works - Ravenscourt Park, W.



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



Reported Jan. 1st.

DIED OF WOUNDS.—Sinclair, Sec. Lt. D., High. L.I., attd. R.F.C.

WOUNDED.—Keeton, Sec. Lt. H., R.F.C.

Starfield, Sec. Lt. B., R.F.C.

MISSING.—Clark, Sec. Lt. A. L., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER IN GERMAN HANDS.—Taylor, Lt. R. C., R. War. R., attd. R.F.C.

AUSTRALIAN FORCE.—Wounded.—Smith, Sec. Lt. R. M., M.C., Fl. Corps.

\* \* \*

#### CASUALTIES AMONG N.C.O.s AND MEN. THE DATES ARE THOSE OF THE OFFICIAL LIST.

##### KILLED.

DEC. 18th.—R.F.C.—Ackroyd 55486 3rd Cl. Air Mech. S., Keighley; McAlpine 27166 1st Cl. Air Mech. J., Tottenham, N.; Myers 106017 3rd Cl. Air Mech. T., Armley; Parsons 57677 3rd Cl. Air Mech. D. N., Hammersmith, W.; Peel 55504 3rd Cl. Air Mech. G., York; Ponder 55663 3rd Cl. Air Mech. H., Islington, N.; Spence 55478 3rd Cl. Air Mech. J. T. Goole; Waters 55470 3rd Cl. Air Mech. J. A., Bethnal Green, E.

##### ACCIDENTALLY KILLED.

DEC. 18th.—R.F.C.—Mariner 7502 1st Cl. Air Mech. B. F. V., Twyford.

##### DIED.

DEC. 18th.—R.F.C.—Stebbing 17854 Actg. Cpl. F. J., King's Lynn.

DEC. 19th.—King 13071 2nd Cl. Air Mech. A. M., Earlsfield, S.W.

##### WOUNDED.

DEC. 18th.—R.F.C.—Andrews 36500 2nd Cl. Air Mech. H. G., St. George's, E.; Earl 7737 2nd Cl. Air Mech. J. F., Peckham S.E.; Hookway 61856 1st Cl. Air Mech. S., Bideford; Miller 77882 2nd Cl. Air Mech. J., Finsbury Park, N.; Tapsell 54798 3rd Cl. Air Mech. F., Strood; Wyatt 36236 2nd Cl. Air Mech. G., Watford.

DEC. 19th.—Cowdy 8213 1st Cl. Air Mech. B. D., East Dulwich, S.E.; Crowe 49035 2nd Cl. Air Mech. W. A., Tufnell Park, N.; Harborough 67655 3rd Cl. Air Mech. O. R., Southport; Whiting 44568 2nd Cl. Air Mech. F., Mile End, E.

DEC. 21st.—Shute 62403 2nd Cl. Air Mech. A., Battersea, S.W.; Stanley 45209 2nd Cl. Air Mech. A. R., Putney, S.W.; Townsend 78616 2nd Cl. Air Mech. H., Oldham.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS OF WAR IN GERMAN HANDS.

DEC. 20th.—R.F.C.—Butler 7216 Serjt. C. J., Mersham; Long 103725 2nd Cl. Air Mech. W. T., Cardiff.

##### AUSTRALIAN IMPERIAL FORCE.

##### KILLED.

DEC. 21st.—A.F.C.—Lauchland 1320 R.

##### WOUNDED.

DEC. 20th.—A.F.C.—Perry 602 R. T.

#### PERSONAL NOTICES.

##### DEATHS.

ANDERSON.—On Dec. 24th an aeroplane fell from a great height on some golf links in Yorkshire. The machine was smashed, and the pilot, Sec. Lt. H. N. S. Anderson, R.F.C., died at the local cottage hospital from his injuries.

COOK.—Mr. John Cook, R.F.C., while testing an aeroplane engine, was struck by the propeller and killed. A verdict of accidental death was returned at the inquest on Dec. 23rd.

EGERTON.—Maj. Robert Egerton, M.C., Royal Irish Fusiliers and R.F.C., who was killed on Dec. 23rd, was the third son of Sir Reginald Arthur Egerton, C.B., and Lady Egerton, of 29, Brompton Square, S.W., and was born in 1892. He was educated at the Oratory School, Birmingham, and at the Royal Military College, Sandhurst, and entered the 2nd Royal Irish Fusiliers in 1913, joining his regiment in India in that year. He proceeded from India with his regiment to the front in Nov., 1914, where he took part in much fighting, and was twice mentioned in dispatches. In March, 1915, he was awarded the Military Cross. He was shortly afterwards invalided home and, being pronounced by a medical board as unfit for trench work for a time, he devoted the interval to learning to fly, and was appointed a flying officer in the R.F.C. He was gazetted a captain and flight commander on March 3rd, 1916, and on Nov. 23rd of the same year a squadron commander, with the rank of major. At the time of his death he was in command of a squadron.

FLOWER.—Sec. Lt. F. G. Flower, R.F.C., killed on Dec. 18th, was the fourth son of the Rev. and Mrs. F. W. Flower, of Oporto, Portugal, and was aged 23. He was born in Oporto, and educated at Richmond Hill School, Richmond, Surrey. After spending several years in Montreal, he volunteered for general

service in 1915 with a Canadian Siege Battery, proceeding to France in the following year. He subsequently obtained a commission in the R.F.C. as pilot.

HOOD.—Sec. Lt. Ronald Paton Hood, R.F.C., who was reported missing on Sept. 28th, was last seen in a fight in the air, and news of his death on that date has now been confirmed. He was the younger of the two sons of Mr. and Mrs. Thomas M. Hood, of Rio de Janeiro. Born in Pernambuco, Mr. Hood was educated at Forest School and Felsted, and on leaving School he at once joined the Artists Rifles in September, 1915, receiving his commission in the R.F.C. last April. He went to the front in May. His C.O. writes:—"He died, as the brave lad he was, doing his duty. He had been with me for four months, and had done valuable service. He was a good pilot, a cheerful and willing fellow, and a great loss to the Squadron."

HOSKYNs-ABRAHALL.—Sec. Lt. Christopher Henry Hoskyns-Abrahall, R.F.A., attd. R.F.C., was accidentally killed while flying alone on Dec. 22nd at Yatesbury, Wilts. He was the younger son of Maj. C. H. Hoskyns-Abrahall, R.M.L.I., who was killed in Gallipoli in 1915, and nephew of Maj. J. H. Hoskyns-Abrahall, late R.M.L.I., of Malvern, Tavistock. He was educated at Kelly College, Tavistock, from which he passed into Woolwich in 1915, in his 17th year. He was gazetted second lieutenant in the R.F.A. the following year, and was attached to the R.F.C. some months ago. His commanding officer wrote most highly of him.

HOYLES.—Lt. Arthur Harry Child Hoyles, H.L.I., attd. R.F.C., who was killed in action on Dec. 2nd, was the only child of Henry Child and Grace Gertrude Hoyles, 57, Kersland Street, Glasgow. He was 23 years of age.

MANSON.—Cadet Eric Douglas Manson, R.F.C., who was killed in an aeroplane accident in Texas, U.S.A., on Dec. 24th, was the only son of the late Capt. Manson, South Lancs Regt., and Mrs. Manson, Bury St. Edmunds. He was 24 years of age.

MANUEL.—Lt. Carrington Manuel, attd. R.F.C., met his death at an Essex aerodrome on Dec. 23rd. Mr. Manuel, who was a Canadian, was coming down after a flight when his machine got into a spin and crashed to the ground. At the inquest a verdict of accidental death was returned.

MITCHELL.—Sec. Lt. Leslie James Mitchell, R.F.C., who was killed on Dec. 21st in an aeroplane accident, was the elder and only surviving son of Mr. and Mrs. James Mitchell, of Belmont, Surrey.

MOTT.—Lt. Arthur Ernest Mott, R.F.C., an Australian, fell with his machine in the sea on Dec. 24th and was drowned.

ORRELL.—Lt. J. T. Orrell, R.F.C., who was killed in action on Dec. 2nd, was the only son of Mr. and Mrs. J. T. Orrell, Fairfield, Manchester, and grandson of the late Percy Orrell, of Openshaw. He was 20 years of age.

OTTLEY.—Lt. Reginald Benade Glendower Ottley, R.F.C., who was killed on Dec. 23rd, aged 21 years, was the last surviving son of Mr. and Mrs. Glendower Coghill Ottley, of 5, Cambridge Court, East Twickenham, Middlesex, whose two other sons have lost their lives in this war, and grandson of Maj.-Gen. C. G. Ottley, Madras Army. Before joining the Royal Flying Corps, Mr. Ottley held a commission in the North Staffordshire Regt.

PARKER.—Lt. William Lefevre Oxley Parker, Hussars, attd. R.F.C., who was reported missing on Oct. 31st and is now known to have been killed in action on that date, was the younger son of Christopher W. and Helen Cecilia Parker, of Faulkbourne Hall, Essex. He was 22 years of age.

He was educated at Ludgrove, Eton (Mr. C. M. Wells's house), and Oriel College. He was in the O.T.C. at Eton and Oxford, and had been a year at Oxford when war was declared. He immediately received orders to join the Hussars, to the Special Reserve of which regiment he had been gazetted ten days previously. He left for France in September, 1915, and was wounded in July, 1916. Last June he was attached to the R.F.C. and went to the front in July.

PRISMALL.—Lt. Merrick Orville Prismall, R.F.A. and R.F.C., second son of Lt.-Col. E. Prismall, T.D. (attd. General Staff, Canadian Overseas Forces), who was killed as the result of an aeroplane accident while flying near Grantham on Dec. 20th, was 25 years of age. He was educated at St. Edmund's College, Old Hall, and served for some time in the Windsor troop of the Berkshire Yeomanry. Leaving England at the age of 18 to explore, he visited Queensland, Northern Territories of Australia, New Zealand, the back blocks of New South Wales, Natal, Orange Free State, and Cape Colony. In 1913 he was serving in the 2nd South African Mounted Rifles, and had his thigh shattered at Estcourt as the result of a gunshot wound. In 1914 he served through the Moritz Rebellion, and afterwards through the German South West African campaign under General Botha. On reaching Windhoek, at the end of this campaign, he applied to fight in France, and returning to England received a commission in the Royal Field Artillery. Going to the Western front early in 1916, he was wounded at the Somme. In February of this year he joined the R.F.C., and served as an observer for



**Of Special  
interest to  
Government  
Contractors.**

Not Mill Furnishing  
— or Hydraulic. —

**J. B. BROOKS & Co., Ltd.**

(Contractors to the Admiralty and War Office,  
Air Board, Ministry of Munitions, etc.).

**and the Leather Specialists**

with the

**Largest Works, Finest  
Equipment, Best  
Facilities and Widest  
Experience in the  
Trade.**

invite enquiries for

**Articles, Parts,  
fitments & cases  
of  
LEATHER.**

Address—

**J. B. BROOKS & CO., LTD.,**  
104 Criterion Works,  
BIRMINGHAM

Telegraphic Address: POETRY, 'PHONE LONDON. (Partners:  
Telephones: AVENUE 995, 996, 7996. 216, 217. H. W. PRITT,  
W. G. PRITT,  
P. W. SMALLWOOD,  
E. R. HILL),

**PRITT & CO.**

**METAL WAREHOUSEMEN, MUNITION  
AND AERONAUTICAL CONTRACTORS**

**46, FENCHURCH STREET,  
LONDON, E.C. 3,**

Where all communications must be addressed.

**CITY WAREHOUSES:** 62a, Vine Street, Minories, E.  
9, Jewry Street, Aldgate, E.C.  
**DEPOTS:** Paddington, Poplar, Shoreditch.

We hold good stocks, complying with Air Board, R.A.F.  
and Admiralty Specifications, of the following:

**BRASS & COPPER** in sheets, tubes, rod, wire, etc.  
**TINNED STEEL SHEETS.**  
**MILD STEEL SHEETS,** 9a.  
**BRIGHT DRAWN MILD STEEL BARS,** 3a.  
**A. G. S. BOLTS, NUTS AND WASHERS.**  
**COPPER RIVETS.** **TINMAN'S SOLDER.**  
**SOLDERING IRONS.**  
**BEST SWEDISH WELDING WIRE.**  
**BRAZING SOLDER** in wire and granulated form.  
**SILVER SOLDER.** **WIRE GAUZE, &c.**

All material passed A.I.D. before despatch.

**DAILY DELIVERIES** made by our own vans within a radius of  
15 miles of our Warehouses.

**NOTE.**—All orders for Aeronautical Work receive especially  
prompt attention.

**WE ARE BUYERS OF SCRAP BRASS & COPPER.**

**R.N.A.S. KIT**

**BURBERRYS**

supply Uniforms,  
Weatherproofs, Leather  
Coats, British Warmes, Fur  
Undercoats, Caps, and  
every detail of R.N.A.S.  
dress and equipment, at  
reasonable prices.

**BURBERRY KIT**

made in special  
cloths, woven and proofed  
by Burberrys, provides  
an effective safeguard  
against wet or wind, and,  
whilst lightweight, is the  
warmest and most com-  
fortable equipment for  
facing the atmospheric  
conditions of varying  
altitudes and climates.

**Complete Kits in 2 to 4  
Days or Ready-to-Wear**

**Service Weatherproofs.**

During the War **BURBERRYS**  
**CLEAN AND RE-PROOF**  
Officers' "Burberrys," Tielock-  
ens, Burfrons, & Burberry Air-  
Warms **FREE OF CHARGE**



**Illustrated  
Naval  
Catalogue  
Post Free**

*Every  
Burberry  
Garment  
is labelled  
"Burberry."*

**BURBERRYS Haymarket S.W. LONDON**  
**8 & 10 Bd. Malesherbes, PARIS; also Provincial Agents**

**RIBLETS**

**FAIRINGS**

**HINGES**

**BUNCHER & HASELER LTD.**  
**STAMPERS & SPINNERS**  
**BIRMINGHAM.**



six months. After eighteen months' service in France he returned to England in September last, and was married to Miss Marie Comerford, of Woodford Green, Essex, at the Brompton Oratory, on Oct. 3rd.

**ROWLES.**—Lt. Stanley William Rowles, A.S.C., attd. R.F.C., of Norham, Oatlands Park, Weybridge, Surrey, who died on Dec. 13th from wounds received whilst flying on Dec. 3rd, was the brother of Lt. W. J. Rowles, of H.M.S. Cyclops, and cousin of T. S. Harris, 4, Lloyd's Avenue, E.C., and Hamerton, Addiscombe Grove, Croydon. He was 27 years of age.

**WALKER.**—Sec. Lt. F. Leslie Walker, R.F.C., who died on Dec. 28th as the result of an accident whilst flying at Thetford, Norfolk, was the only son of Fred and Amy Walker (Bentley), of 23 Farrer Road, Hornsey, N.8. He was 19 years of age.

#### ENGAGEMENTS.

**BANKART—CROOK.**—An engagement is announced between Lt. Hugh C. Bankart, Middlesex Regt. and R.F.C., eldest son of Mr. and Mrs. George Bankart, of 37, Old Deer Park Gardens, Richmond, Surrey, and Lilian Winifred, elder daughter of Mr. and Mrs. H. A. Crook, of Brockley, S.E.

**BOWEN—DIXON.**—The engagement is announced of Lt. Trevor Bowen, Yorkshire Regt. and R.F.C., and Florence, second daughter of W. John Dixon, M.A., LL.M., of the Inner Temple, and granddaughter of the late Mr. Edwin Dixon, Merridale Grove, Wolverhampton.

**CLARKE—JENKINS.**—The engagement is announced of Lt. P. H. Clarke, R.H.A., attd. R.F.C., and Beatrice, only daughter of Mr. J. Jenkins and Mrs. Jenkins, of Southampton.

**HICKS—HARRIS.**—An engagement is announced between Lt. Geoffrey A. Hicks, R.G.A., attd. Anti-Aircraft Section, eldest son of Mr. and Mrs. Alfred Hicks, of Rotherfield, Sussex, and nephew of Mr. Joynson-Hicks, M.P., and Maisie, only daughter of Mr. and Mrs. Charles Harris, of Brookwood, and niece of Sir Ernest Moir, Bart.

**PETERS—NASH.**—An engagement is announced between Lt. Arthur Bowden Peters, R.F.C., and Stella Kathleen, second daughter of Mr. and Mrs. G. Nash, of Lyndhurst, St. Brannock's Road, Ilfracombe.

**PULLEN—BORRETT.**—The marriage of Lt. Walter H. Pullen, R.F.C., and Miss Constance Borrett will take place at All Saints' Church, Reading, on Saturday, January 5th, at 2.15. There will be no reception, but friends will be welcome at the church.

**SCOTT—HERVEY.**—The engagement is announced, and the marriage will shortly take place, between Capt. Frank P. Scott, Yeomanry and R.F.C., and Osyth, youngest child of the late William G. E. Hervey and Mrs. Hervey, of Selborne, Hants, and granddaughter of the late Lord Charles and Lady Harriet Hervey.

#### MARRIAGES.

**BANNISTER—MINOGUE.**—On Dec. 16th, at St. Mary Abbot's, Kensington, Sec. Lt. T. H. C. Bannister, R.F.C., son of the late Thomas Bannister, J.P., was married to Annie, widow of Col. James Minogue, W. York. R., daughter of the late Hilton Philipson, J.P., and Foundress and Commandant of Mornington Lodge War Hospital for Officers. The bridegroom was accompanied by Col. Sir Buchanan Scott, K.C.I.E., R.E., formerly Master of the Mint, Calcutta, and the bride was given away by her brother, Mr. Ralph Philipson, of 74, Portland Place, W.

**BUDGEN—HEANE.**—On Dec. 19th, at St. Nicholas Church, Newport, Salop, Capt. W. D. Budgen, Leinster R., attd. R.F.C., was married to Evelyn Bridgett, youngest daughter of the late R. N. Heane and Mrs. Heane, of Newport, by the Rev. W. Budgen, R.D., father of the bridegroom and Rector of the Parish, assisted by the Rev. W. P. Nock, Rector of Longdon.

**CAMP—ENDERSON.**—On Dec. 20th, at Richmond, Surrey, Arnall W. Camp, R.F.C., eldest son of Llewellyn E. Camp, J.P., of Queensmead, Richmond, was married to Jean Henderson, daughter of Mr. and Mrs. G. A. Henderson, of Cochrane, Ontario, by the Rev. E. F. Drew and the Rev. Jabez Bridge.

**COPNER—FLORIZOONE.**—On Dec. 27th, at the Catholic Church, Petersfield, Lt. Eric C. L. Copner, The Devon Regt. and R.F.C., was married to Paula, youngest daughter of the late Maitre Florizoone, of Bruges, by the Rev. R. Dalrymple, S.J.

**FULFORD—LONGBOTTOM.**—On Dec. 20th, at Christ Church, Sheffield, Sec. Lt. H. F. Fulford, R.E., attd. R.F.C., was married to Edith Mary, daughter of Dr. Longbottom.

**MILNER—NICHOLSON.**—On Dec. 27th, at St. John's, Dewsbury Moor, Lt. Geoffrey Milner, R.E., attd. R.F.C., youngest son of Mr. and Mrs. John Milner, Savile Town, Dewsbury, was married to Kathleen Isabel, eldest daughter of Mr. and Mrs. C. L. W. Nicholson, St. Heliers, Dewsbury, by the Rev. F. H. Sangster, Vicar.

**ROBERTSON—WEIR.**—On Dec. 18th, at Perth, Lt. Charles Pennycook Robertson, R.F.C., eldest son of Mr. and Mrs. Pat Robertson, Forneth, Dunkeld, was married to Elizabeth Anderson Jack, eldest daughter of Mr. and Mrs. John Weir, School House, Murkle, Caithness, by the Rev. P. Gordon Clark, West U. F. Church.

**SMITH—WOOD.**—On Dec. 20th, at Esher Parish Church, Maj. Charles Gainer Smith, R.F.C., son of the late Mr. W. Whitney Smith, and of Mrs. Smith, of Bathwick, Bath, was married to Kathleen Mary Frances, third daughter of Mr. Albert J. Wood, of Vancouver, B.C., and granddaughter of the late Wm. Wood, of Moss Close, Walsall, by Capt. the Rev. H. B. W. Denison, Chaplain to H.M. Forces, assisted by the Rev. J. K. Floyer.

#### BIRTHS.

**BURCH.**—At the Nursing Home, Wellington Square, Ayr, on Christmas Day, to the wife of Lt. R. S. Burch, R.F.C., a son.

**CARMICHAEL.**—On Dec. 19th, at Beaulieu, Hants, to Kathleen Mary Foxon, the wife of Lt.-Col. G. I. Carmichael, D.S.O., R.F.A. and R.F.C., a son.

**CHADWICK.**—On Dec. 19th, at Lady Howard de Walden's Home, Regent's Park, N.W., to Dorothea (*née* Knight), wife of Captain H. Lloyd Chadwick, R.F.C., a son.

**EEMAN.**—On Dec. 28th, to Capt. L. E. Eeman, R.F.C., and Mrs. Eeman, 55, Belsize Park, N.W.—a son.

**HOOPER.**—On Dec. 24th, at Greengates, Filton, Glos., the wife of Maj. C. A. Hooper, R.F.C., of a son.

**HYNES.**—On Dec. 20th at Ivy House, Devizes, the wife of Capt. H. G. Claude Hynes, Indian Army, attd. R.F.C., of a son.

**LEASK.**—On Dec. 14th, at 39, Kensington Square, the wife of Capt. P. A. O. Leask, Royal Irish Rifles and R.F.C., of a son.

**MACNAB.**—On Dec. 22nd, at 34, Hill Street, Knightsbridge, the wife of Capt. C. S. Macnab, Cameron Highlanders, attd. R.F.C., a daughter.

**MERIVALE.**—On Dec. 2nd, 1917, at Toronto, Canada, the wife of Cpl. Philip Merivale, R.F.C., of a son.

**MODIN.**—On Dec. 21st, at 50, Wyndham Road, Salisbury, to "Bay," the wife of Maj. O. Modin, D.S.C., R.F.C., a daughter.

**MORTIMER.**—On Dec. 28th, at Morley Cottage, Chislehurst, the wife of Sec. Lt. G. Mortimer, R.F.C.—a son.

**NATHAN.**—On Dec. 21st, at Brockleaze, Headington Hill, Oxford, the wife of Capt. A. A. Nathan, Yeomanry and R.F.C., of a son.

**SPENCER.**—On Dec. 20th, at Bratton House, Wincanton, Somerset, the wife of Lt. R. H. Spencer, R.A. and R.F.C., of a son (Peter Rowland).

A message from Berne states that among the British prisoners of war arrived from Germany on Dec. 28th for internment in Switzerland are the following officers:—

Captain—Southon, R.F.C.

Lieuts.—Carmichael, R.F.C.; Drury, R.F.C.; Harle, Northd. Fus., attd. R.F.C.; Murray, R.F.C.; O'Byrne, R.F.C.; Orde, R.F.C.; Parkes, R.F.C.; Robertson, R.F.C.; Toogood, R.F.C.

\* \* \*

Mr. W. A. Willison, the Canadian correspondent on the Western front, telegraphing on Dec. 26th, says:—

Poor visibility has made aeroplane observation difficult, so difficult, in fact, that three German low-flying machines, mistaking trenches, swept their own trenches with gunfire yesterday.

\* \* \*

Reuter's correspondent with the British Forces in Palestine, writing on Dec. 28th, says:—

The Flying Corps continues to do good work. It took part in the fighting yesterday morning, bombing and machine-gunning the enemy's rear. Our aviators also made things unpleasant for the Turkish motor and sailing craft on the Dead Sea, where navigation is practically at a standstill. These flying men claim with justice to have flown under the sea-level.

#### FRANCE

##### OFFICIAL COMMUNIQUÉS.

**DEC. 22nd.**—The noise of aircraft motors was reported at 8.20 this evening coming from a north-easterly direction. The alarm was immediately given throughout Paris, and some star-shells were sent up by the anti-aircraft defences in the outer suburbs. The all-clear was sounded at 9.15.

**DEC. 23rd.**—During the period from Dec. 11th to Dec. 20th inclusive, 14 German aeroplanes were brought down by our pilots and three others were compelled to alight within their lines.

In addition, on Dec. 5th, 10th, and 11th, three enemy aeroplanes were brought down by our anti-aircraft gunfire.

In the course of the evening of the 22nd, enemy aeroplanes dropped some 40 bombs on Dunkirk and its suburbs. One





# JOHN MACLENNAN & CO.

Telegrams: "Vandura Cent," London. 30/21, NEWGATE ST., LONDON, E.C. 1 Telephone: City 3115.  
(And at GLASGOW.)

## TAPES. WEBS. CORDS.

MACHINE & HAND-SEWING THREADS, ETC.  
CONFORMING TO GOVERNMENT SPECIFICATIONS  
FOR AERONAUTICAL WORK.  
DELIVERY FROM STOCK.

CONTRACTORS TO H.M. GOVERNMENT

## THE AIRCRAFT CONSTRUCTION CO.

EVERY DESCRIPTION OF METAL COMPONENTS.

IMMEDIATE DELIVERY OF **SE5 SUMPS, part 11612-1**

**HARLEY AEROPLANE WORKS, Beckton Rd. E 16**

Telegrams: "Aercracons," Canning, London.

'Phone: East 1300.

Registered Trade Mark.



Non-Inflammable Transparent Celluloid.

**LONDON LABEL CO., Ltd.,**

Contractors to H.M. Government.

**HARLEY WORKS, BECKTON RD., LONDON, E.**

**WIND SHIELDS  
MAP COVERS  
OBSERVATION PANELS**  
*Prompt deliveries of every type.*  
**LUMINOUS PRINTING**

Labels for Instrument boards, &c., for night work.

Any special article made up to templates or drawings and delivered by return.

N.B.—Nonflamoid is very much lighter and easier to work than any kind of glass, also it will stand much harder usage.

'Phone: BOURNEMOUTH 2039.

Telegrams: "WORMS, BOURNEMOUTH."

CONTRACTORS TO H.M. ADMIRALTY & W&R OFFICE.

# WORMS AIRCRAFT CONSTRUCTION CO.

(MAX WORMS)

**Rutland Works, Rutland Road,**

**BOURNEMOUTH.**

London Office:

4, SACKVILLE STREET,  
PICCADILLY, W. 1.

Telegrams: "HUNFYA, PICCY, LONDON."

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



person belonging to the civilian population was killed and three others were wounded, including a woman and a child.

DEC. 24th.—On Dec. 21st, 22nd, and 23rd, our chaser aeroplanes showed great activity. Our pilots were engaged in about 100 fights, most of them taking place over the German lines. Eighteen German aeroplanes were brought down, of which 10 either fell in flames or were destroyed on crashing to the ground.

During the same period our bombing squadrons dropped 18,000 kilogrammes (about 18 tons) of bombs on railway stations, munition factories, cantonments, and military buildings of the enemy behind his lines.

DEC. 25th.—A German aeroplane was brought down in aerial fighting during the 24th. Another machine, during the evening of the 23rd, was brought down in our lines by the fire of our special guns.

On the evening of the 22nd, Dunkirk and its environs were bombarded by enemy aeroplanes. Several victims are reported.

DEC. 27th.—A German aeroplane was brought down in an air fight during the day on Dec. 24th.

Our bombing aeroplanes dropped 5,000 kilogrammes (about 5 tons) of explosives on enemy railway stations and establishments in the region of Rethel and Vouziers (both on the Aisne, north-east of Reims).

DEC. 29th.—During the night of Dec. 28th-29th our aeroplanes bombarded the railway stations at Mézières-les-Metz and Thionville, as well as the enemy establishments in the region of Vouziers and Rethel.

DEC. 30th.—Three German aeroplanes were brought down during the day on Dec. 29th, one of them by the fire of our special guns.

ARMY OF THE ORIENT.—French and Greek squadrons bombarded and machine-gunned the enemy encampments in the valley of the Vardar.

DEC. 31st.—ARMY OF THE ORIENT.—French aviators dropped bombs on the station of Mrzentzi (about two miles north of Ghevgegi).

\* \* \*

The recently created French Air Board, which has been sitting daily, is reorganising the different services and speeding up the construction of machines. It will meet thrice weekly.

The head of the new Air Board, or Higher Council of Aviation, is the Minister for Armaments, assisted by the Under-Secretary of State for Aeronautics, the representative of G.H.Q., and the heads of the various services concerned. A programme of the needs of various types of machines will be drawn up by G.H.Q. and transmitted through the Under-Secretary for Aeronautics to the Air Board, which will consider it in relation to the available raw material. The decision of the Board is final.

\* \* \*

A Reuter's message from Paris states that the papers of Dec. 21st announcing the death of the aviator Capt. de la Tour recall the fact that the aviator belonged to the famous "Cigogne" squadron. He was a comrade of Capt. Guynemer and a pupil of Brocard.

Capt. de la Tour accounted for eleven enemy aeroplanes without including the more numerous victims he claimed far behind the German lines.

## GERMANY.

### OFFICIAL COMMUNIQUÉS.

DEC. 23rd.—The aerial activity, which continued very strong throughout the day in many sectors, was also very lively during the moonlit night.

Bombs were dropped freely on Shoerness, Dover, and Dunkirk, as well as the munition depots behind the English and French fronts.

\* \* \*

It is reported from Amsterdam on Dec. 21st that Capt. Hans Hesse recently flew from Berlin to Mosul (on the Tigris) in ten days. The actual flight took 34 hours.

\* \* \*

"The Times" correspondent in Berne on Dec. 28th, says:—

Reports received at Basel of the aerial bombardment of Mannheim on Dec. 24th state that the British airmen appeared over the station only an hour after the departure of the Kaiser *en route* from the front. The station is said to have been partly destroyed and the railway badly damaged. A bridge over the Neckar was demolished, and a factory in the north of the town was blown up.

This account is confirmed by acquaintances of mine who were in Mannheim at the time. They do not believe, however, that the station was hit.

\* \* \*

A semi-official communication to the German Press with reference to the air attack at Mannheim on Dec. 25th says that no military damage was caused, that two persons were killed and about a dozen wounded, no soldiers being among them, but several French prisoners of war. One aeroplane was

brought down in the Palatinate, the occupants being taken prisoner.

\* \* \*

The "Frankfurter Zeitung" states that several camps have been established in various districts of Stuttgart and in the neighbourhood for British, and more particularly for French, war prisoners of all ranks, and also some hospitals for convalescent war prisoners. The newspaper remarks:—"They will have to share with the population of the town of Stuttgart the dangers of enemy air attacks."

## ITALY.

### OFFICIAL COMMUNIQUÉ.

DEC. 21st.—During the day of yesterday enemy troops were bombarded with visibly effective results by our Capronis on the Old Piave, and during last night by our airships to the east of Valdobbiadene (on the Piave, north of Montello).

DEC. 27th.—A big aerial battle, in which British and Italian chasing squadrons and anti-aircraft artillery participated, was fought yesterday over Treviso (about 18 miles north of Venice). In the morning 25 enemy machines, under cover of the haze, arrived over our aviation camp to the west of the city and commenced to bombard it. The hostile aircraft, received by violent anti-aircraft fire and attacked impetuously by the aeroplanes risen from the camp, were forced to retire before having carried out the operation; eight enemy machines were brought down.

Later, about 12.30 p.m., another hostile squadron of eight machines made the attempt again, but was faced over Montebelluna (behind the British lines on Montello) and forced to retire, losing three machines.

Of the 11 enemy aeroplanes brought down, eight fell within our lines and three in the enemy's lines. All our machines returned to their base.

The damage produced by the bombardment is insignificant.

DEC. 28th.—A powerful squadron of Caproni machines was sent against large hostile forces reported in the Ronchi Valley, at the head of Val Frenzela, and our aircraft bombarded them with very satisfactory results.

From the Brenta to the coast artillery actions only took place, our medium-calibre guns shelled an aviation camp in the vicinity of Congliano, six miles east of the Piave, forcing the enemy to evacuate it.

DEC. 29th.—Yesterday evening at 9 p.m. enemy aviators, true to their innate barbarian impulses, which have been revived by the defeat they suffered on Dec. 26th at Treviso, bombarded the inhabited parts of Treviso, Montebelluna, Castelfranco, and Padua, all open cities.

In the centre of Padua, where the population is densest and the finest monuments are more numerous, eight bombs were dropped, killing 13 persons and wounding 60. Among the casualties, for the most part women and children, there are only six soldiers. No monument was damaged. There was no damage done or casualties caused in the (? other) cities.

DEC. 30th.—Yesterday evening enemy aircraft repeated the raid on Padua, dropping over 20 explosive and incendiary bombs in the city. Three killed, including one child, and three wounded, including one woman, are to be deplored. Much damage, in parts great, was done to the monuments and private dwellings; buildings and two hospitals were damaged; a fire broke out in St. Valentino Church, which was hit, and the tower of the Carmine Church has been partly burnt.

DEC. 31st.—Yesterday in the Monte Tomba sector, French troops stormed with magnificent élan the enemy positions between Osteria di Monfenera and Naranzine.

British and Italian aviators co-operated effectively in the action.

The enemy becomes more bitter in the bombardment of open cities. Last night his aviators returned for the third time over Padua, dropping between 9 p.m. and 3 a.m. several score of bombs. Fortunately, owing to the arrangements made by the civil and military authorities, the casualties were only five wounded, including one woman.

The rich artistic patrimony of the city instead suffered severely. The façade of the Cathedral was blown down, and the basilica of the "Santo" (the sepulchral church of St. Anthony of Padua) and the Municipal Museum were not a little damaged.

Our machines, flying during the night, bombarded very effectively the enemy's aviation camps at Aviano and La Comina, which they found lighted up awaiting the return.

In the night seaplane squadrons respectively bombarded with excellent results enemy aerodromes between Godigo and S. Fior, and enemy encampments in the vicinity of Torre di Mosto (Livenza).

\* \* \*

The correspondent of the "Daily Chronicle," writing from Milan on Dec. 29th, says:—

Circumstantial accounts have just been released by the censorship of the great aerial battle over Treviso (17 miles north of Venice), in which no fewer than 11 enemy battleplanes were



**AIRCRAFT DEPARTMENT**



THE WORLD'S LARGEST MANUFACTURERS OF ALL KINDS OF ENGRAVED METAL GOODS

**British Metal (Kingston) Ltd.**  
*The Factory,*  
 Kingston on Thames.

**DIALS & INSTRUCTION PLATES**  
 MADE IN ANY METALS,  
 IVORY, IVOROID, BONE, ETC.  
 ANY QUANTITIES, WORDING, DESIGN,  
 SIZE, SHAPE OR COLOURS.

— — — — —

COMPLETE SHEET METAL  
**AIRCRAFT COMPONENTS**  
 RIVETED, SWEATED, BRAZED OR WELDED.  
 R.E.8, F.E.2B.&D, B.E.2C-D-E,  
 SE5, De H6.  
 RESIDENT A.I.D. EXAMINER.

**Alardux**

Alardux is the New Aluminium Flux

A Welding Flux of exceptional merit

May we send you a sample?

The Alardux Co.,  
 23, Fleet Street,  
 London, E.C.4.

City 866.

# TIMBER

SILVER SPRUCE

ENGLISH ASH

WALNUT & MAHOGANY

**JOSEPH OWEN & SONS**  
 Limited

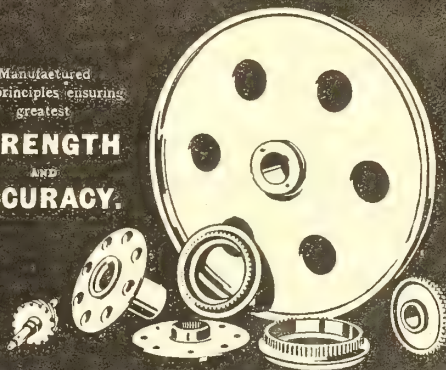
Borough Saw Mills,  
 LONDON, S.E.1.

Telephone: Hop 3811. Telegrams: "Bucheron Sedist."

## MOSS— AERO-ENGINE GEARING

Manufactured  
 on principles ensuring  
 greatest

**STRENGTH**  
 AND  
**ACCURACY.**



**GEARING — FLYWHEELS — CAMSHAFTS**

R.A.F. PROPELLER BOSSES.

Our Aero parts are made in specially **HIGH TENSILE**  
**STEEL**, heat treated and all parts corrected for distortion.

**TRANSPORT, LORRY & PLEASURE CAR GEARING**

Bevel and Worm Drives accurately generated. Steering Worms and Sectors.  
 Spur and Bevel Differentials. Gear Box Gears. Camshafts with guaranteed  
 Glass-hard Cam Profiles.

# —GEARING

**THE MOSS GEAR CO., LTD.**

W. DUCKITT, Managing Director, Thomas St., Aston, BIRMINGHAM

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



dashed to destruction. It is the most thrilling episode of the kind that has happened on the Italian front.

Four British aviators were already in the air at nine o'clock on Boxing Day morning, when 25 enemy bombing planes, supported by another 50 chasers—which latter maintained an altitude of about 10,000 ft.—suddenly swooped down through a thick fog over the extensive Italian aerodrome on the outskirts of Treviso, and began hurling incendiary bombs at the hangars and machines ranged ready for flight in the open, and pouring volleys of Maxim-gun fire into groups of aviators and soldier assistants on the field from a height of barely 150 feet.

Some minutes elapsed before the Italian commander could rally his men to their machines in the midst of the fierce bombardment. Meantime 40 big bombs had been thrown. Hardly, however, had 15 Italian pilots mounted in the air than the enemy bombers began beating a hasty retreat, in which their chaser escort failed to support them. Nearing the Piave they found their way barred by four British Royal Naval aeroplanes, with the Italian aeroplanes pressing close in their rear.

Presently a thin trail of flame and grey smoke swept the sky. A monster Albatross pitched headlong to the ground at Signorossa, its three occupants being flung out in mid-air. Then, in quick succession, the second fell at Venegazzu, the third at Biadene, the fourth at Casarenato, the fifth at Casa Martinbianco. Yet three more fell a prey to English fire in the neighbourhood of the Montello foot hills. With one exception, all the shattered machines were Austrian.

Three hours later another Austro-German squadron of nine machines crossed the Allied lines, and, though the main object was doubtless to gain information about the missing planes, the crews vented their spleen by bombarding the defenceless cottages of Montebelluna.

But within a few minutes a big Aviatik, manned by Germans, and two Austrian bomb planes, fell in the Italian lines along the Piave, and a fourth was driven to descend on the farther side of the river. Meantime, English and Italian soldiery were busily scouring the country to locate the wrecks.

One machine only was found intact. The rest were either burnt or smashed to bits. The charred bodies of six Austrians were recovered. One German officer and an Austrian subaltern were captured unhurt. Four other enemy officers, badly wounded, were borne to hospital.

To-day several enemy pilots flew over the Venetian plain at a high altitude, dropping messages asking for tidings of their missing comrades. Obviously, the real object of the dramatic encounter was to destroy utterly the Allied aerial forces, which thwart the Austro-German endeavour to bombard Treviso, Padua, and the towns near the littoral.

#### HOLLAND.

An official statement was issued at The Hague on Dec. 28th by the Dutch Minister for Foreign Affairs announcing that the British Government had apologised for the violation of Dutch territory, in the neighbourhood of Breskens (Province of Zeeland), on Oct. 2nd, by seven British aeroplanes, and adding that the British Government had given "special and emphatic orders to all British Naval Air Forces to avoid Dutch territory in future."

\* \* \*

The "Telegraaf" of Dec. 23rd. learns from Goes that a number of bombs were thrown there on Dec. 22nd, injuring one man severely and one woman slightly. Six or seven bombs were dropped on a house, entirely destroying the upper part. One bomb fell into the harbour, damaging all the shipping there.

#### U.S.A.

Reuter's correspondent with the American Army in France writing on Dec. 24th says:—

When the American air fighters begin arriving in large numbers they will find a corps of several thousand American air mechanics, who have been trained in England, waiting to assemble the parts and repair the machines. Already many Air Service squadrons and Aviation Park repair squadrons are being sent to England and when they are trained they will cross the Channel as they are needed.

The report goes on to say that it is inadvisable to disclose the strength of the Corps. It is sufficient that the Army Estimates have provided that more than enough efficient men shall be available at all times, as America's success in the air will depend primarily upon these men. Extensive training quarters are being established. The Government at Washington has been asked to send to England 1,300 bricklayers and carpenters, and also hundreds of labourers for construction work at these training quarters.

Arrangements are being made for the establishment in the United States of large flying schools. These are to be established in America rather than in Europe for two reasons: in the first place, the flying conditions are better; and in the second, the utilization of training planes and equipment in the United States will save the tonnage which would be involved in the transportation of so much material to this side of the Atlantic.

#### DROWNED HONOURS.

Under this same heading the leader writer of the "Morning Post" dealt scathingly on January 1, 1918, with Mr. Lloyd George's (plus Mr. Bonar Law's) New Year Honours lists, pointing out that "any man in civilian employment might in these days well shrink from accepting honours which the fighting men have so much better deserved." The comparatively meagre rewards to the Flying Services emphasise this writer's attack, in which, referring to the vast quantities of honours lavished on civilians of unobvious merit, he says it seems as though the Prime Minister, like Hotspur, were resolved "to dive into the bottom of the deep and pluck up drowned honour by the locks."

Among such a seething mass of politicians, lawyers, place hunters, provision purveyors, war profiteers, journalistic hacks, popular members of the so-called "four arts," and provincial tub-thumpers as those on whom honours of various degrees and assorted kinds have been conferred, one is perhaps glad to see that no name of anyone concerned with British Aeronautics is included. Yet one cannot help a horrid suspicion that when, in a few days' time, a list of New Year appointments to the Most New, if Honourable, Order of the British Empire comes to be published, we may find therein some of the pioneers of British Aviation.

One sympathises in advance with the recipients of any such "honours," for they are placed in the dilemma of having to accept a handle which they do not want to their already distinguished names, or refusing it and perhaps by doing so disheartening their employees, who might regard the omission of their chief's name from a list in which rivals were included as a reflection on the firm's work.

Those who fought for and achieved the Conquest of the Air before the war, risking their lives and their fortunes as literally as any soldier in the field is taking like risks to-day deserve a better fate than to be afflicted with O.B.E.s., and such decorations as pertain to minor war profiteers and moderately successful Government contractors. To the pioneers of the British Aircraft Industry is due the pre-eminence of the Royal Naval Air Service and of the Royal Flying Corps—each in its respective sphere—for without that war in the air before the war, and without the heavy casualties which then befell the little army of pre-war aviators, our Flying Services would to-day be in a very inferior position. Therefore, to present the pioneers of aviation at this date with orders and decorations intended for cheese-mongers and boot-manufacturers strikes one as being very like honouring, say, General Sir David Henderson after the war by electing him Mayor of Tooting.

Already the most new and honourable order is nicknamed the Order of the Bad Egg, and is regarded as distinctly inferior to the older orders. It is true that the latest list of names of C.B.s., as compiled by Messrs. George and Law, does not make one hanker after their distinguished companionship, but probably those who have honours thrust upon them would prefer being drowned in the bath to being engulfed in commercial eggs.—C. G. G.

[The Special Military Issue of THE AEROPLANE will be issued next week. As the supply is strictly limited, those who wish to make certain of securing a copy will be well advised to order at once from their newsagent, or direct from the Wm. Dawson Publishing Co., Ltd., 2, Breems Buildings, E.C.]



## AEROPLANE



## ACCESSORIES

7 Years' Experience.

**Sturtevant**

(REG. U.S. PAT. OFF.)

## CONNECTING RODS

Forged from special chrome nickel steel which has a tensile strength of 280,000 pounds per square inch; machined all over; exceptionally light; perfectly balanced; Sturtevant white metal and phosphor bronze are used for bearing linings.

**B. F. STURTEVANT COMPANY**  
Hyde Park, Boston, Mass.

Selling Agents,  
**STURTEVANT ENGINEERING CO. LTD.,**  
147 Queen Victoria Street, London, England.

SALMSON  
AERO-ENGINES

(Canton-Unné System).

All enquiries should be addressed to  
**THE DUDBRIDGE IRON WORKS,**  
LIMITED,

87, Victoria Street, London, S.W. 1.

Telegrams .. .. Aeroflight, Vic. London.

Telephone .. .. 7026 Victoria.

THE POOLE AVIATION CO.  
POOLE, DORSET.

Contractors to H.M. Government.

Spares and all Parts of Machines.

ENQUIRIES INVITED.

'Phone: Poole 54.

'Grams: Aviation, Poole.

CONTRACTORS TO H.M. GOVERNMENT

## W.T. CLARK &amp; CO.

Telephone  
No.  
Central  
2121.

S. GREEN TERRACE,  
ROSEBERY AVENUE,  
LONDON, E.C.1.

Telegrams  
Etalspinne  
Isling. London.  
Two Words

METAL SPINNERS  
and

## SHEET METAL WORKERS

for Aeroplane Constructors

METAL SPINNINGS for AEROPLANES

Cowlings (COMPLETE SET)

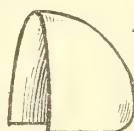
Coverings

Undershields

Fairings

Petrol Tanks

Shields etc.



BEATEN COWLS

OF EVERY

DESCRIPTION

SPUN COWLS

UP TO

48 INCHES

IN DIAMETER.



KINDLY MENTION "THE AEROPLANE"

WHEN CORRESPONDING WITH ADVERTISERS.

## THE INVASIONS OF ENGLAND.

The following was issued on Dec. 21st:—

"The Press Bureau is authorised to state that it has been established from our pilots' reports that a raiding aeroplane was struck by machine-gun fire from one of our machines over London during the raid on December 18th. Subsequently observations proved that this raider went off in a damaged condition and was ultimately brought down in the sea off the Kentish coast two hours later."

\* \* \*

On Saturday, Dec. 22nd, an air raid took place on the South-East Coast under the circumstances recorded in the official communiqué. The continual weeding out of stray Gothas indicates the satisfactory maintenance of the Anti-Aircraft defences. This sole visitation during the Christmas week-end is doubtless attributable in some measure to the unfavourable weather conditions, but it is also some indication that the enemy has other things to think about, and that raiding England has not yet become a really serious portion of the day's work. One would hesitate, however, to say that it will not become so during the course of the next few months, and the present toll of enemy aeroplanes, and the admitted dislike on the part of the enemy to our barrage, should lead no one to believe that the worst Germany can do in the nature of air raids has yet been experienced.

\* \* \*

A correspondent of the "Daily Mail" contributes an account of the engagement which took place over London on the night of Dec. 18th, between one of the raiding Gothas and a British defence aeroplane, which supplements in some measure the bald official statement that British aeroplanes flew over London and fired at some of the raiders. The correspondent declares that he saw several searchlights focussed on a Gotha, and that a smaller machine could be seen climbing towards the German aeroplane when the anti-aircraft shells ceased to burst in the vicinity. He states that the machines approached within 25 yards of one-another, and that the machine-gun fire could be heard. The Gotha made every attempt to get away. Finally, the German machine turned over and dived, and disappeared. According to the "Daily Mail," three enemy machines in all are reported to have been seen by searchlight, and that a further engagement took place over Essex without apparent result.

One gathers indirectly that the description of the "Daily Mail" correspondent is substantially accurate, and it has since been officially admitted that the enemy aeroplane over London

was actually damaged. One gathers that the most important part of the damage was the stoppage of one of the engines, and the journey all the way to the coast with the remaining engine is something in the nature of a performance, in view of the relatively low efficiency of the Gotha.

One hopes that the recent success with aeroplanes for defence against night raids by German aeroplanes, under conditions which made many people sceptical as to their value, will encourage not only the flying officers, but also the whole personnel of the Home Defence Squadrons to further efforts, and that it will remove any misapprehensions as to the value of Home Defence duty.

\* \* \*

A London coroner held inquests on Dec. 28th on the bodies of children who had died after being taken out into the night air in consequence of unofficial and false reports of air raids, and made an appeal to the public to disregard such reports. He said that everybody who went about spreading false rumours and frightening people should be prosecuted.

## RELATIVE IMPORTANCE.

From the "Evening Standard" of Dec. 31st:—

Addressing the Miners' Federation delegates at a conference on the war work volunteer scheme, Sir Auckland Geddes, according to a report issued to the miners' organisations, said the big needs of the country were steel, tonnage, aerodromes, and aircraft. Those formed four big heads for which men were required.

Sir Auckland added that we have to build aerodromes at a rate and to a number which nobody a year ago ever dreamed of as being required, and we have to arrange for a very big output of air engines and aeroplanes.

## CONGRATULATIONS.

KEMP-WALTON.—On Dec. 27th, at Ilona, High Wycombe, to Mr. and Mrs. T. Kemp-Walton—a daughter.

## MORE ZEPPELIN TROUBLES.

The "National Tidende" (Copenhagen, Dec. 29th) states that it is reported from Jutland that a Zeppelin airship fell into the sea on Dec. 28th, on fire.

[Note.—Owing to pressure on space it has been necessary to hold over the usual Aircraft Finance pages.—Ed.]

Telephones: DALSTON 872.

LONDON WALL 9766.

HAMPSTEAD 4768.

# Thames Aviation Works

(BURTON'S, LTD.)

**TWO COMPLETE MILLS, PLANTS AND TWO YEARS' EXPERIENCE.**

**Erecting Shops and Saw Mills:**

(Addresses may be had on application.)

**Offices only: 141, CURTAIN ROAD, E.C.**

**CONSTRUCTORS OF COMPLETE AIRCRAFT**

**And all kinds of WOOD PARTS, WINGS, AILERONS,**

**— STRUTS, LEVERS, RUDDERS, NACELLES, &c. —**

**Specialities—BIG STUFF and BEST WORK.**





Established 1897.

Godbold's

Manufacturers of Bowden Wire and of all  
Levers and Accessories used in its application.

*Trade Marks and Names:*

Bowdensolo	Bowdenite
Bowdenoir	Bowdensilver
Bowdenamel	Bowdenbrass

THE varied uses and adaptations  
of Bowden Wire Mechanism are  
recognised by almost every department  
of State Service. The War work  
which we have in hand precludes for  
the present our acceptance of private  
orders.

Victoria Road,  
Willesden Junction,  
London, N.W.10.

## Books to be Noted—and Bought

### The Aeroplane Speaks

By CAPTAIN H. BARBER, R.F.C.,  
5th edition. 6s. 6d. net, 7s. post free.

### Military Aeroplanes

By G. C. LOENING. 6th edition. 21s.  
net, 21s. 6d. post free.

### All the World's Aircraft

Edited by C. G. GREY. 21s. net, 22s.  
post free.

### Aeroplane Design

By CAPTAIN H. BARNWELL. With  
a Chapter on Inherent Stability, by  
LIEUT. SAYERS. 2s. 6d. net, 2s. 9d.  
post free.

### An Airman's Outings

By "CONTACT." 5s. net, 5s. 4d. post  
free.

### Air Navigation for Flying Officers.

LT.-COM. A. E. DIXIE, R.N. 10s. 6d.  
net, 11s. post free.

### The Flying Book

Edited by W. L. WADE. 3s. 6d. net,  
3s. 9d. post free.

### Ballads of the Flying Corps

By G. R. SAMWAYS, R.F.C. 2s. 6d.  
net, 2s. 9d. post free.

### Songs of the Submarine

By "KLAXON." 2s. net, 2s. 3d. post  
free.

### Small Factory Output

By G. H. MANSFIELD. 1s. 3d. net,  
1s. 6d. post free.

Any of the above books may be ordered through the  
Bookseller or will be sent on receipt of remittance by  
The Wm. Dawson Publishing Co., Rolls House, Breems Buildings, E.C.



## The OUTPUT and EFFICIENCY of YOUR FACTORY

CAN BE GREATLY INCREASED BY ADOPTING  
MODERN METHODS OF LIGHTING AND  
MACHINE DRIVING BY ELECTRICITY.

THIS SUBJECT IS MY CONSTANT AND SPECIAL STUDY.

*Ask for Booklet on*

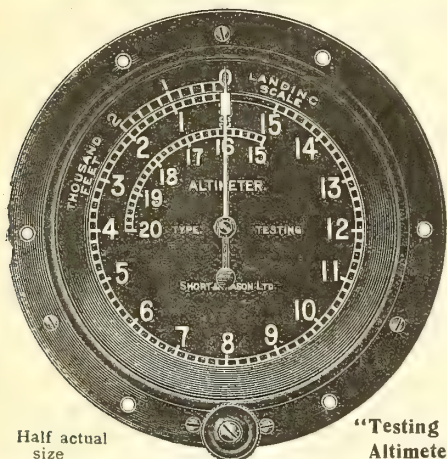
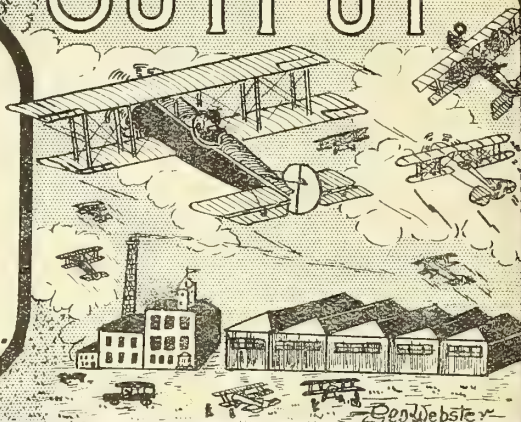
**"Modern Machine Tool Lighting."**

Contractor to the WAR OFFICE, MINISTRY OF MUNITIONS, H.M. OFFICE  
OF WORKS, and some of the leading Aeroplane Makers.

**E. STANLEY FARDON, AMIEE.**

67, MOSLEY STREET,  
MANCHESTER.

# OUTPUT



Half actual  
size

"Testing Type"  
Altimeter.

## ALTIMETERS

FOR

## AIRCRAFT

MANUFACTURED BY

**SHORT & MASON LTD.**

Aneroid Works, WALTHAMSTOW, E.17.

# STRANDS & CABLES

## FOR ALL AVIATION PURPOSES.

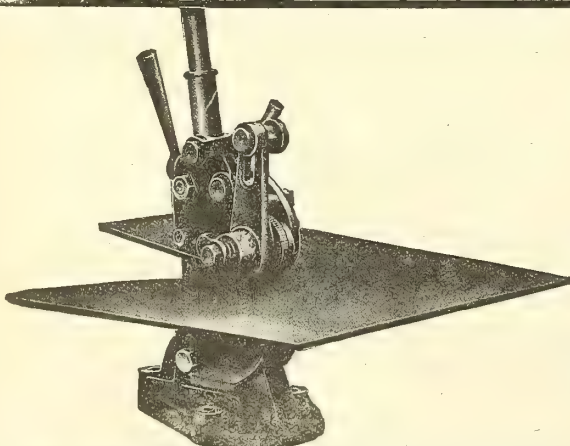
Composed of Tinned Steel Wire of the Highest Quality.

:: Descriptive Booklet on Application.

Head Office  
and Works:

**GEO. CRADOCK & Co., Ltd., Wakefield.**

London Office: 7, EAST INDIA AVENUE, E.C.3.



## 'TANGENT'

HAND

SHEET SHEARING MACHINE

PATENT.

SELF-FEEDING, FAST CUTTING.

STEEL, 3/16". SOFTER METAL, 1/4."

Write for Descriptive Pamphlet and Prices.

**MONTGOMERY, SMITH & Co., Ltd.,**

PATENTERS AND MANUFACTURERS,

TANGENT WORKS, KEYNSHAM, SOMERSET.

KINDLY MENTION "THE AEROPLANE"

WHEN CORRESPONDING WITH ADVERTISERS.



**BLACK  
ENAMEL.**

**AEROPLANE  
GREY PAINT (flat).  
Oil and Petrol  
Resisting.**

**TRANSPARENT  
WOOD FILLER.**

**Subject to  
A.I.D.  
Inspection.**

# HARLAND'S

VARNISHES, ENAMELS  
AND FINE COLOURS.

By Appointment to



His Majesty the King.

**MERTON, LONDON S.W.19.**

ESTABLISHED 1791.

**GOPAL  
VARNISHES  
for  
AIRSCREWS  
and  
EXPOSED  
WOOD PARTS,  
&c.**

**WHITE DOPE  
RESISTING PAINT.**

**Subject to  
A.I.D.  
Inspection.**

## METAL FITTINGS

Wire  
Work.

## PRESS WORK

Turn Buttons.  
Eyelets.  
Washers.

## TURNED BRASS PARTS.

**W. H. BRISCOE & Co., Ltd.,**

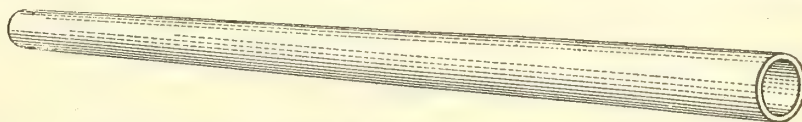
51, 52, 53, PARK STREET,

**BIRMINGHAM.**

Tel.: 550 Central  
Tel. Ad.: BRISK, BHAM.



Patent No. 4704/15



## McGRUER SPARS

are THE ACME of  
STRENGTH and LIGHTNESS

Particulars from:—

**McGRUER BENTWOOD HOLLOW SPAR Co.,**

Commercial Wharf, Lambeth, LONDON, S.E.1.

# R. F. & F. W. BROWN

(F. W. BROWN.)

Wollaton Saw Mills  
Near Nottingham.

**ENGLISH ASH FOR AEROPLANES**  
**Bent Timber Manufacturers.**

Telephone .. 1526 Nottingham.

Telegrams .. Browns, Sawmills, Wollaton.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

# THE BRITISH WRIGHT CO. LTD.

Owners of the British, Italian and Belgian Patents  
of Wilbur and Orville Wright.

Manufacturers of  
**AERONAUTICAL  
INSTRUMENTS**  
FOR  
NAVY & ARMY AEROPLANES

**Ggilvie Air Speed Indicators**

for use on Aeroplanes, Airships, Kite  
Balloons and Air Stations.

**Statoscopes.**

**Recording Manometers.**

**Wind Speed Recorders.**

At present the Government is taking the entire output, but  
British and Foreign firms are invited to place their orders  
now for delivery of Aeronautical Instruments after the War.

**The BRITISH WRIGHT Co Ltd.**  
33, CHANCERY LANE, LONDON, W.C.2.

# LEARN TO FLY

— AT —

## Bournemouth.

— THE —

**LARGEST AND MOST UP-TO-DATE  
CIVILIAN SCHOOL IN ENGLAND.**

*Immediate Vacancies.*

**RAPID TUITION.**

43 Caudron Service Biplanes (Solo & Dual Control).

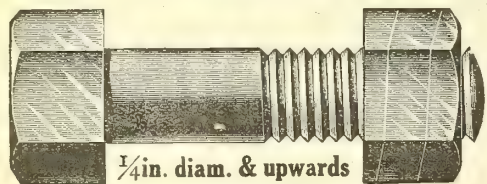
**SPECIAL TRAINING**

for Pupils intending to enter the R.F.C. or R.N.A.S.

**APPLY :**

**Bournemouth Aviation Co., Ltd.,**  
AERODROME, BOURNEMOUTH. (Phone 1160).

# BRIGHT BOLTS & NUTS



1/4 in. diam. & upwards

(Suitable for Every Description of Engineering Work)

**QUALITY, ACCURACY AND FINISH GUARANTEED**

THE  
**"HELICOID" LOCK-NUT**

(THE FINEST LOCK-NUT IN THE WORLD.)

This nut will remain secure, no matter how great  
the vibration may be—in fact vibration actually  
tightens the grip.

(made from 3/16 in.  
to 2 1/2 in.)



(sample nut & prices  
on application)

We also manufacture Wrought Iron Railing and Gates, etc.

**BAYLISS, JONES & BAYLISS,**  
LTD.  
**WOLVERHAMPTON.**

London Offices: 139/141, CANNON ST., E.C.4.

Contractors to H.M. Government.

TRADE



MARK

# SWIFT AVIATION CO.

**Dolphin Engine Plates in Stock,  
Complete Sets.**

*Speciality Sopwith Spares.*

# KINGSTON

PHONE—  
732 KINGSTON

'GRAMS—  
"SWIFT, KINGSTON"



# JAMES PUTMAN, Southern Works, AYLESBURY

Manufacturer of Aero Hangars and  
every Description of Canvas Work.

SEVEN AND A HALF ACRES OF WORKSHOPS.

Contractor to Air Board, War Office, Admiralty,  
Ministry of Munitions and H.M. Office of Works.

'Phone: 57 Private Branch Exchange.  
Telegrams: "Putman, Aylesbury."

## "NOVELLON" DOPE

AND AEROPLANE VARNISH.

CELLULOSE ACETATE & CHEMICALS

### BRITISH CELLULOSE & CHEMICAL MANF'G.

Telegrams:

COMPANY, LIMITED.

Cellutate, London.

8, WATERLOO PLACE, S.W.1.

'Phone: Regent 4045.

Works: Spondon, Derby; and Maybury Gardens, High Road, Willesden Green, N.W.10.

(Telephone: Willesden 2380.)

We make  
a  
Speciality  
of every  
Description



of Plates,  
Gauges and  
Dials for  
Aeroplanes,  
etc., etc.

Write for our "A" List.

# PLYWOOD

In all Thicknesses and Qualities.

## SIBERIAN & GENERAL TRADING CO., Ltd.,

1-3, Leonard Street, City Road, LONDON, E.C.2.

Telegraphic Address: "Wolosey, Finsquare, London."

Telephone: London Wall 3577.

## THE BURTON AIRCRAFT

And MANUFACTURING Co., Ltd.

Aeronautical  
Engineers,

BURTON-ON-TRENT.

CONSTRUCTORS OF AIRCRAFT.

*Estimates given for all Parts.*

'Phone:—  
554 BURTON.

Telegrams:—  
PLANES, BURTON-ON-TRENT.

## Dials, Instruction Plates, ETC.,

in Brass, Copper, Aluminium,  
Ivory. We specialise in  
above for the Aeroplane  
industry, both chemically and  
— machine engraved. —

**CLEGG METAL ENGRAVING Co.**  
CHATSWORTH WORKS, WORTHING.

## "CERTUS" COLD GLUE POWDER.



Sanctioned for Classes 1 & 2 on Aircraft work.  
Simply mix with cold water, ready for use in  
ten minutes. Extraordinary strength on all  
woods—soft, stone, iron, &c Great covering  
capacity, very economical, water and heat  
proof. Extensively used in French and  
Italian Aircraft Factories.

Manufactured by  
**CENTRAL CHEMICALS Ltd.**

283, WEST END LANE  
LONDON,  
N.W.6

Works—  
KENSAL ROAD,  
Westbourne Pk., W.

Telegrams: "Entramical, Westhamp, London."

Manufacturers  
.. of ..

**PHOSPHOR BRONZE,**

**GUN METAL,**

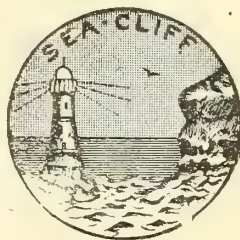
MANGANESE BRONZE.

**BRASS & COPPER**

TUBES, SHEETS,  
RODS, WIRE, AND

**CASTINGS.**

PHOSPHOR TIN,  
PHOSPHOR COPPER.



**CHARLES CLIFFORD & SON, LTD.,**  
BIRMINGHAM.

## "BOWSER" AEROPLANE SEATS

(Made to A.G.S. Drawing 264).

Supplied to the Royal Aircraft Factory and the Leading Aircraft Manufacturers.

Manufactured by **EDWARD BOWSER, 50, Park Lane, Leeds.** Tel. No: Central 3473.

Under the A.I.D. Inspection

London Representative—  
MR. HARRY LOVEDAY,  
67, New Oxford Street, W.C.1

Northern Representative—  
MR. WALTER M. DANIELL,  
33, East Beach, Lytham.

Telephone—Works: East 3833. Offices: City 89.

Telegraphic Address—"Gunsiguob, Estrand, London."

## THE STANDARD Aircraft Manufacturing Co., Ltd.

Office: EFFINGHAM HOUSE, ARUNDEL STREET, LONDON, W.C.

Works at BOW COMMON LANE, LONDON, E.

## STANLEY PROPELLERS

By the STANLEY AVIATION CO.,

TELEPHONE  
CITY 8347.

67, KINGSLAND ROAD,  
LONDON, E.2.

GOVERNMENT  
CONTRACTORS.

# Lang Propeller LTD.

Contractors to  
the Admiralty  
and War Office.  
**WEYBRIDGE,  
SURREY.**



# GRACE & MARSH

for all classes of finished

## WOODWORK FOR AEROPLANES.

Aircraft Works,  
Tamworth Road,  
Croydon.

'Phone:  
1576 Croydon.

STAMPINGS  
WASHERS  
REPETITION WORK

in all Metals

BRIGHT DRAWN STEEL

FOR

AIRCRAFT and MOTOR WORK

**J. B. GUTHRIE & SON**

(JOHN J. GUTHRIE)

30, ST. MARY AXE, LONDON

TELEGRAMS—BUSIRIS LED, LONDON. E.C.3.  
TELEPHONE—AVENUE 1432.

## Berling Magneto

insures a hot, fat  
spark at any  
altitude

Worth more  
Does more



Manufactured  
by the  
**Ericsson Mfg. Co.**  
Buffalo N.Y. U.S.A.

## EARN WHILE YOU LEARN.

'HOW TO MAKE MONEY BY WRITING.'

**£50** IN CASH PRIZES. Send 2d. postage for Particulars and Copy of "How to Earn Money While Learning How to Write for Newspapers and Magazines." Practical and comprehensive Course of Personal and Private Correspondence Instruction in all kinds of Writing—Reports, Articles, Sketches, Verses, Poetry, Songs (words), Short Stories, Serials, etc., by experienced Literary Directors. Work criticised constructively. **Free Advice.** Beginners taught how to make work saleable. MSS. placed for publication at highest rates of remuneration. Cash paid immediately on acceptance.

Address: "EDITORIAL" (Dept. R.),  
22, CHANCERY LANE, LONDON, W.C.2.

## Aeroplane Steel Sheets

as supplied by us to

**The Royal Aircraft Factory**  
and leading Aeroplane Makers

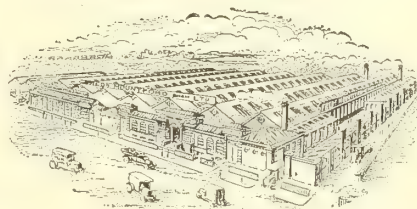
Guaranteed to comply with the R.A.F. No. 9A specification. Stocked in all gauges. (Sheets are passed and stamped by the "A.I.D.")

**BERNARD NICKLIN & CO.**

IRON AND STEEL WAREHOUSE  
SMETHWICK, BIRMINGHAM

Telegraphic Address:  
"Bernico," Birmingham.

Telephone No.:  
224 Smethwick.



A Modern  
Factory  
replete  
with every  
modern  
facility.

## "FREMO" TAPER PINS.

Every "FREMO" pin is turned out with a view to adding to a lead already won for **THE UTMOST RELIABILITY.**

*Fred Mountford & Sons Ltd*

**FREMO WORKS, LIFFORD, BIRMINGHAM.**

**CLABOUR-WESTBAY**

:: FOR ::

**2.B.A. Bolts—A.G.S. 103**

Entire Output at present absorbed  
—by Government Requirements.—

**W. A. Clabour, Westbay & Co.,**  
KIRKSTALL, LEEDS. Ltd.

Phone: Headingley 709

Telegrams: Clabour, Kirkstall.

# BLERiot

## AERONAUTICS

Contractors to

**WAR OFFICE AND ADMIRALTY**

Works and Offices

**ADDLESTONE (SURREY)**

**NORBERT CHEREAU, General Manager**

Telegrams "BLERiot, WEYBRIDGE."

Telephone 190 Byfleet.



## TRADE CARDS.

## AEROPLANE TIMBER SPECIALISTS

**JOSEPH OWEN & SONS, Ltd.,**  
**Borough Saw Mills, LONDON, S.E.**  
 Telephone: HOP 8811 Telegrams: "BUCHERON, SEDIST."

## B.D.V. AIRCRAFT SPARES

ALL KINDS OF METAL FITTINGS, TUBE  
 WORK, SHEET METAL WORK, STAMPINGS,  
 :: WELDING, AND ALL COMPONENTS ::  
 Enquiries to **B. D. V. Aircraft Spares,**  
**PRINCES STREET WORKS, RICHMOND, SURREY.**  
 Telegrams: "Aeros, Richmond." Phone: Richmond 1681.

**JAMES NORTH HARDY & SON, LTD.,**  
 54, PORTLAND STREET, MANCHESTER,  
 MANUFACTURERS of all descriptions of COTTON and LINEN  
**WEBS, TAPES & TWINES FOR AIRCRAFT**  
**AND ELECTRICAL WORK.**  
 London Branch: 3, FITCHETT'S COURT, NOBLE STREET, E.C.  
 Mills: HEATON PARK, nr. MANCHESTER.  
 Tel. Add.: "HARDSON," Manchester Phone: No. 6471 Central.

Trade **MENDINE** Mark.  
**LIQUID SCOTCH GLUE**  
 USED BY THE LEADING AEROPLANE CONSTRUCTORS.  
 MOISTURE PROOF.  
 Write for Price List and Particulars  
**MENDINE CO., 3, Arthur Street, London Bridge, E.C.**

## Chavrière's famous Integral Propellers

HOLD ALL RECORDS; USED BY ALL  
 LEADING AVIATORS. THE BEST  
 Sole Proprietors for Great Britain and Colonies  
**THE INTEGRAL PROPELLER CO., LTD.,**  
 Edgware Road, The Hyde, Hendon, N.W. 9.  
 Telephone—Kingsbury 104. Telegrams—"Aviprop, Hyde, London."

**NAME PLATES.**  
 WE SPECIALISE IN EVERY DESCRIPTION OF  
 NAME PLATES IN METAL, IVORINE, ETC.  
**CLEGG METAL ENGRAVING CO.,**  
 CHATSWORTH WORKS, WORTHING.

## EBORA PROPELLER COMPANY LTD

*Ebora*

**PROPELLERS**  
 Contractors to the ADMIRALTY & WAR OFFICE  
 11 & 12 SURBITON PARK TERRACE, KINGSTON-ON-THAMES  
 Telephone: KINGSTON 672 Telegrams: "EBORA, KINGSTON"

FOR THE  
**"AEROPLANE" SPECIAL NAVAL & MILITARY NUMBERS**  
 you will require striking, original and effective designs  
 or your special advertisement. Order these at once from  
**GEORGE WEBSTER**  
 5 Norton Street, Old Trafford, Manchester.  
 Specialist in Aviation designs.  
 See Messrs. Thompson Bros. and E. Stanley Pardon's advertising in this issue.

## Springs! Springs! Springs!

We make a speciality of  
 Springs for Aeroplanes.  
**SEND FOR PRICES.**  
**Dart Spring Co., West Bromwich.**

**SAVE TIME.**  
**H. DUNSHEATH & CO.,**  
 Makers of Every Description of  
 STEEL MARKS, DIES, LETTERS, FIGURES, BRASS  
 STAMPS AND IRON BRANDS.  
 Seals, Brass, Tin and Zinc Labels, Time Checks, Stencil  
 Plates, Brass Name Plates, Rubber Stamps, &c.  
**30, ARUNDEL STREET, SHEFFIELD.**

**METRIC BOLTS & NUTS (5 m/m to 8 m/m).**  
 Stock Lists on Application.

## CASHMORE BROS.,

TELEPHONE: 415 BATTERSEA **Zota Works** HILDRETH ST.,  
 BALHAM, S.W.  
 Screw-Cutting and Light Engineering. Accessories for Aircraft,  
 Electrical and Motor Trades. Brass and Iron Founders.

**Advertising**

For GOOD ADVERTISING consult  
 Godbolds, 8, Breams Buildings,  
 London, E.C.4. Estimates Free.  
 Phone: City 5912. E. H. Godbold,  
 Director



**SCREW-DRIVING**  
**RUSSELL BROTHERS, Ltd., REDDITCH**  
**MACHINES.**

**FREDK. WARD**  
 — FOR —  
**Aero Engine and Gun Gear Parts**  
 ALSO PATTERN AND JIGS.  
**ALLSOP ST., UPPER BAKER ST., N.W.**  
 Phone: Paddington 4743.



## MISCELLANEOUS ADVERTISEMENTS.

## AIRCRAFT PARTS.

ardwood for Aeroplanes.—Specially Selected  
dried timber as supplied to leading con-  
structors in Britain and the Continent. Silver  
pruce, Ash, Poplar; Hickory and Ash  
id; Three-ply; Thin Cedar and Mahogany  
Floats; Walnut for Propellers.—William  
allinson and Sons, Ltd., Hackney Road,  
horne, 3845 Central, 4770 Wall.

pes, Webs, Cords and Threads in all quali-  
ties, suitable for Aircraft Work. Delivery from  
ck.—John MacLennan and Co., 30, New-  
gate Street, London, E.C.1. (See Advertise-  
ment Page 105 and Buyers' Guide.)

eroplane Seats to any drawing or specifica-  
tion. Prompt deliveries.—F. C. Chappell,  
ne Works, 9, Fisher Street, Nottingham.

We specialise in De H. 6 Fittings, and can  
supply from stock blankings for all metal  
parts; also tanks, cowls, and all special eye-  
bolts, etc. Send us your enquiries.—The  
Grahame-White Aviation Co., Ltd., Hendon.

Aeroplane Seats. We can give quick delivery  
of cane seats, A.G.S. 264 or other patterns,  
guaranteed pass inspection. Write us for  
anything required in cane work.—The Willow-  
brook Company, Leicester.

Luminous paint for wrist watches, clocks,  
match boxes, etc.; remains luminous for  
years. Bottles 1/6 and 2/9.—Tobin & Co.,  
39, Charles Street, Hatton Garden, E.C.

## MISCELLANEOUS.

Nerve Failure speedily cured, self-conscious-  
ness eliminated, concentration increased, and  
confidence restored by sympathetic hypnotic  
suggestion. Interesting explanatory booklet  
post free.—Robert McAllan, Regent House,  
Regent Street, W.1.

## AVIATION INSTRUCTION

on up-to-date lines, by a qualified Engineer  
in Aeronautics. Demonstrations from com-  
plete set of parts, and sectioned models.

Send for Prospectus No.1.A.,  
THE MOTOR TRAINING INSTITUTE  
LTD.,

10, Heddon Street, Regent Street, W.1.

# HIDE GLUES FOR AIRSCREWS AND AIRCRAFT CONSTRUCTION.

— APPROVED BY H.M. ADMIRALTY AND A.I.D. —

Manufacturers—Wm. OLDROYD & SONS, Ltd., 9, Mincing Lane, London, E.C.3

Telephone: 4978 Avenue.

TELEGRAMS:  
"EDIBRAC," PHONE,  
LONDON."

## IMPERIAL LIGHT LTD.

123, VICTORIA STREET, LONDON, S.W.1.

TELEPHONE:  
3540 VICTORIA  
(3 LINES).

# FLUXES FOR WELDING

# HEATING

By Steam or Hot Water  
HANGARS, DOPE SHOPS & AIRCRAFT WORKS

and a complete system of

CHAS. P. KINNELL & Co., Ltd.,  
65, Southwark Street, London, S.E.1.

# VENTILATION

# RUBBER

P.R. TUBINGS APPROVED A.I.D.

'Phone:—CITY 3811 and 3812.

WASHERS, RINGS, BUFFERS, SHEET, STRIP, MATTING, MOULDINGS.

JAMES LYNE HANCOCK, Ltd., 266 Goswell Rd., London, E.C.1

## SUBSCRIPTION FORM.

(Subscriptions from Officers and Men of the Navy, and of the British Expeditionary Forces are charged at Home Rates.)

he Publisher,  
THE AEROPLANE,  
2, Breams Buildings, London, E.C.

Please send me THE AEROPLANE for ..... months, for which I enclose  
.....value.....

N .....  
.....

Address.....

SUBSCRIPTION RATES: Home, 3 months 3s. 10d. 6 months, 7s. 7d. 12 months 15s. 2d.  
Abroad " 5s. 0d. " 10s. 0d. " 20s. 0d.  
Canada, One Year, \$4.70c. The United States of America, One Year, \$5.20c.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



## MISCELLANEOUS ADVERTISEMENTS.

**SPECIAL PREPAID RATE:** 18 words 1/6; Situations Wanted ONLY, 18 words 1/-; 1d. per word after. **TRADE ADVERTISEMENTS,** in these columns, 3 lines 3/-; 10d. per line after. Public Announcements, Legal Notices, Auctions, Contracts, etc., 1/6 per line. For the convenience of Advertisers, replies can be received at the offices of "THE AEROPLANE" 166, Piccadilly, London, W.1.

## PATENTS.

**AGE & ROWLINSON,** Chartered Patent Agents (Consulting Engineer, Mr. S. E. Page, A.M.Inst.C.E.), 27, Chancery Lane, London, W.C. Tel. 332 Central.

**Henry Skerrett,** Chartered Patent Agent, 24, Temple Row, Birmingham.—Patents, trade marks, and designs.

**Inventors advised free.** Write for booklet.—King's Patent Agency, Ltd., 165, Queen Victoria Street, London. 30 years' references.

**Stanley, Popplewell and Co.,** Patent Agents and Consulting Engineers. Applications for Patents attended to in all countries.—38, Chancery Lane, W.C. Telephone: 1763 Central. Circular free.

## SITUATIONS VACANT.

**Fitters** wanted for rudders, fins, elevators, sternposts, under-carriages, spar boxes. Good price given. Day-work or piece-work. No one residing more than ten miles away or already engaged on Government work need apply.—The Swift Aviation Co., Richmond Road, Kingston-on-Thames.

**Wanted, Sheet Metal Workers,** fitters, and turner-fitters, must be first-class men. No one on Government work or residing more than ten miles away need apply to:—Harley Works, Beckton Road, Plaistow, E.16.

**Clerks** (Male or Female) required immediately for large aircraft works on South Coast. Experienced in general costing of wages and materials. Must be quick and accurate. No one at present engaged on Government work need apply.—Reply, in first instance, stating experience and salary, to nearest Employment Exchange, mentioning this paper and Box No. 3233.

**Chief Cost Clerk** required immediately for large aircraft works on South Coast, to organise and control working of offices. Must be an experienced and capable man, thoroughly acquainted with up-to-date and quick methods of costing. Good prospects for a suitable man. No one at present engaged on Government work need apply.—Reply, in first instance, stating experience and salary, to nearest Employment Exchange, mentioning this paper and Box No. 3232.

**Chief Storekeeper** (female) required immediately for large aircraft works on South Coast, to take entire control under purchasing department of general aircraft stores. Must be well educated and able to direct labour. No one at present engaged on Government work need apply.—Reply, in first instance, stating experience and salary, to nearest Employment Exchange, mentioning this paper and Box No. 3234.

**Draughtsmen** wanted for large aircraft works on South Coast. Previous experience desirable. No one on Government work need apply.—Reply, in first instance, stating experience and salary required, to nearest Employment Exchange, mentioning this paper and Box No. 3235.

**First-class Sheet Metal Workers** required; thoroughly used to aircraft petrol tank work. Top rate of pay. Apply personally or write. No one on Government work or residing more than ten miles away need apply.—Super Aviation Co., 154, Dalston Lane, E.8.

**Foreman** wanted in Birmingham district to control about 50 hands engaged on aeroplane plate and tubework. Must be good organiser and able to cope with extension. No one residing more than 10 miles away or engaged on Government work need apply.—Reply, stating experience and wages required, to Box No. 3240, THE AEROPLANE, 166, Piccadilly, W.1.

**Wanted Metal Workers** for aeroplane assembling in E.C. district. No one residing more than 10 miles away or engaged on Government work need apply.—State experience, wages, etc., Box No. 3242, THE AEROPLANE, 166, Piccadilly, W.1.

**Wanted** at once, Aeroplane Assemblers for works in E.C. district. Must be good mechanics. No one residing more than 10 miles away or engaged on Government work need apply.—Box No. 3241, THE AEROPLANE, 166, Piccadilly, W.1.

**Chief Inspector and Assistant Inspectors** required for metal working section in aviation factory, London district. Thoroughly capable men with previous experience of aircraft work essential. No person residing more than 10 miles away or already on Government work need apply.—Reply, stating age, full particulars of experience, and salary required, to Box No. 3237, THE AEROPLANE, 166, Piccadilly, W.1.

**Required Men** for planning and progress departments in aircraft factory, London district. Technical knowledge of aeroplane work an advantage, but not absolutely essential. No person residing more than 10 miles away or engaged on Government work need apply.—Reply, stating age, particulars of experience, and salary required, to Box No. 3236, THE AEROPLANE, 166, Piccadilly, W.1.

## SITUATIONS WANTED.

**Works Manager,** or would take charge of outside erection or experimental work, 36, practical engineer having invaluable experience of both seaplanes and aeroplanes, been exclusively engaged in manufacture of complete machines: strict disciplinarian, tactful controller of labour, energetic and methodical organiser, capable of economically increasing production.—Apply Box 2057, THE AEROPLANE, 166, Piccadilly, W.1.

**Test Pilot.** Five years' flying experience, all types, land and seaplanes, is open for engagement with firm as resident pilot. Would be prepared to undertake other duties when not flying, if desired. Box No. 3202, "The Aeroplane," 166, Piccadilly, W.1.

**Outdoor Gang.**—Three first-class erectors used to engine and acceptance tests, and the usual routine of allocated machines road transport, etc., seeking a similar position, or in works with a live firm.—Box No. 3229, THE AEROPLANE, 166, Piccadilly, W.1.

**Works Manager.**—Aero engine manufacturer is open to offer from progressive firm. Has had first-class experience in manufacture of rotary and stationary engines from laying out of shops, plant, and tool equipment to actually producing in quantities to R.A.F. and Adm. specifications.—Apply to Box 3239, THE AEROPLANE, 166, Piccadilly, W.1.

**Gentleman,** aged 49, discharged from Army last February, requires situation national importance, where knowledge of timber, measurements, calculations, would be useful.—Box No. 3238, THE AEROPLANE, 166, Piccadilly, W.1.

**Experienced Works Manager or Production Manager,** with special knowledge of aero engines, machinery, and metal, is open for engagement. Good organiser and successful in handling labour.—Replies to Box 3243, THE AEROPLANE, 166, Piccadilly, W.1.

## WANTED.

**Wanted Woodwork** for aeroplanes, very large up-to-date factory, fully equipped with latest machines; any class of aircraft work undertaken; prompt deliveries; best work.—Apply Box 3030, THE AEROPLANE, 166, Piccadilly, W.1.

**Engineering Firm** with well-equipped machine shops, now engaged on munitions, solicits inquiries for all classes of turning, drilling, grinding, milling, fitting, etc. Aircraft fittings, also copper pipe work, a speciality. Correspondence with a view to post-war business especially invited.—The Lankester Engineering Co., 39, Eden Street, Kingston-on-Thames.

## FOR SALE.

**Aeroplane Radiators.**—The Gallay Radiator Company, Limited, stock Aeroplane Radiators. For the benefit of Constructors, can supply radiators for experimental purposes at a nominal cost. Advice given on suitable types for the various approved engines. Our drawing office is always at our clients' disposal.—198, Great Portland Street, London, W.1.

**To Aeroplane Manufacturers and Others.**—Rochester, within 30 miles of London. To be sold, with immediate possession, valuable freehold premises, comprising an area of about 10,300 sq. ft., with ample buildings, including mill, with 12-h.p. gas engine and all necessary woodworking machinery, offices, stores, and other buildings.—Full particulars of Messrs. Prall and Prall, Auctioneers and Surveyors, Rochester, Kent.

**Testing Machine.** Olsen, tensile and Compression to 50,000 Kgs. perfect condition, complete with 2 h.p. motor, cheap, must sell.—Box No. 3228, THE AEROPLANE, 166, Piccadilly, W.1.

## ENGINEERING.

**British School of Aeronautics.**—Aircraft Engineering Course; Aero Design; Aero Construction; Aero Draughtsmanship; Mechanical Engineering.—Pennington's, 254, Oxford Road, Manchester.

## PUBLICATIONS.

**"Military Aeroplanes,"** by G. C. Loening. Sixth Edition now ready, 21s., post free 21s. 6d.—The Wm. Dawson Publishing Co., 2, Breems Bldgs., London, E.C.



# THE AEROPLANE

WEDNESDAY, JAN. 9, 1918

Edited by  
C. G. Grey

Vol. XIV. No. 2

THREEPENCE WEEKLY

[Registered at the G.P.O.  
as a Newspaper.]

## THE NORMAN THOMPSON FLIGHT CO. Ltd.

ESTABLISHED 1909

Telegrams—SOARING, BOGNOR  
ENTIFLYTE CHARLES, LONDON

Works—MIDDLETON, BOGNOR

CONTRACTORS TO THE ADMIRALTY

Telephone—BOGNOR 48. GERRARD 7385

London Office—  
DEWAR HOUSE, 11, HAYMARKET, S.W.1.

DESIGNERS AND MANUFACTURERS OF FLYING BOATS AND LAND PLANES

**Auster** FOR **Aero-shields**  
LONDON. BIRMINGHAM

**BEARDMORE** AERO  
ENGINES

**TITANNINE**  
NON-POISONOUS  
**DOPE**  
SEE ADVERT. INSIDE.

**ACCLES & POLLOCK, LTD.**

WELDLESS STEEL TUBES — OLDBURY, BIRMINGHAM.

**TRIPLEX** Safety GLASS

See Advt. inside



# . THE . ENGINEERING TIMBER CO. Ltd.

11, Victoria Street, London, S.W.1.

J. E. HUSON, Managing Director

Telephone: Victoria—5078, 4210

Telegrams: Entikosil. Vie. London.

**SILVER SPRUCE**

**ASH**

**WEST VIRGINIAN SPRUCE**

**WALNUT**

**MAHOGANY**

**GLASGOW:**

**67, HOPE STREET.**

Telephone: Central 3273.

Telegraphic Address: Entikosil, Glasgow.

**PARIS AGENCY:**

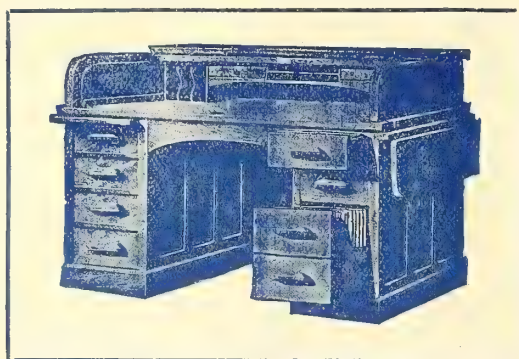
**5, RUE NOUVELLE, PARIS.**

## Factory & Office Furniture

LARGEST STOCK FOR IMMEDIATE DELIVERY.

(NEW AND SECOND-HAND)

SPECIALITÉ



SAFES.

## COOKE'S (FINSBURY) LTD.

INCORPORATING

The FINSBURY OFFICE  
FURNISHING Coy.

&

J. W. COOKE  
& Coy.

FINSBURY PAVEMENT HOUSE, LONDON, E.C.2.

Telephones: LONDON WALL } 6179.  
573.

See Telephone Book relating to our Shopfitting, Signs and other Departments.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# Check Time & Cost Records & Increase Output

It is of the greatest importance to have accurate cost records, thereby gaining efficiency and providing complete estimates.

They enable the management to keep a finger on the pulse of the business, to eliminate designs which involve too costly machining processes, and to maintain an intelligent grip on all jobs going through the works.

Excessive time on jobs is brought to light at once, and the knowledge gives the power to **reduce costs and increase output.**

The patent "Clipper" Time Recorder offers an efficient system of **costing**, and enables Weekly time and Job time to be brought together on **one card.** Weekly time on face of card, and summary of Single Operation Job Tickets on back of card.

Job time registered "On" and "Off" on face of Single Operation Job Ticket. Name of worker, rating, time allowed, description of work to be done and other particulars, printed on back of Ticket.

For Information on other systems, and the combined Time and Job system, write to:—

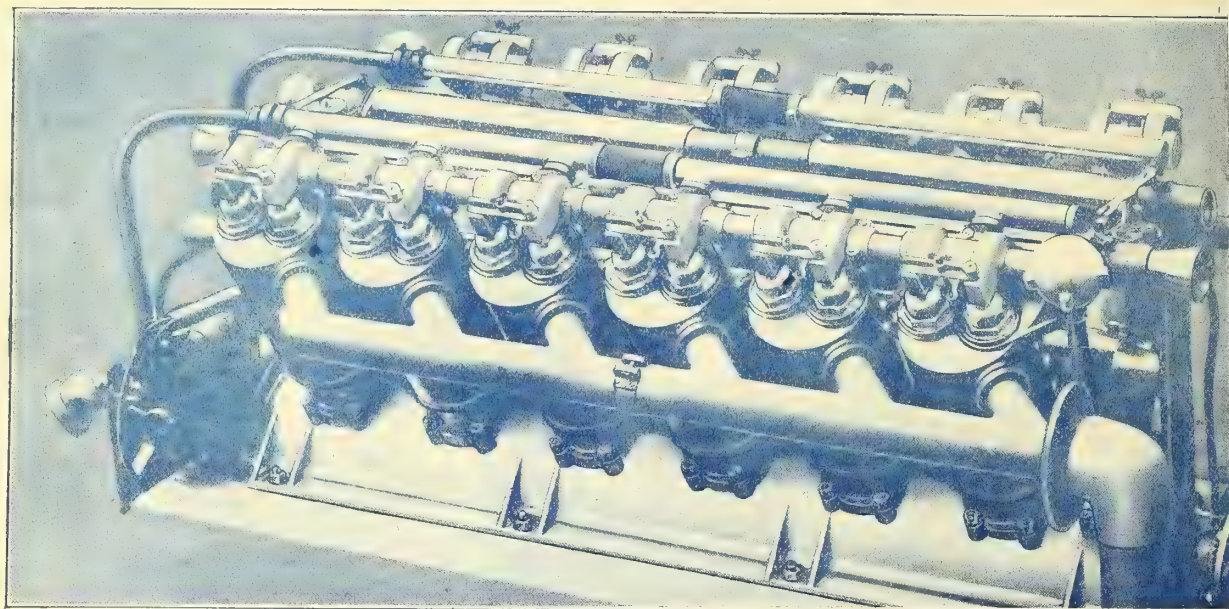
**The Gledhill-Brook Time Recorders Ltd.** 26 VICTORIA STREET, LONDON, S.W.  
43 MARKET STREET, HUDDERSFIELD.  
44 HILL STREET, BIRMINGHAM.

No.	Name		A. Verity	
369	Week ending		September 8, 1916	
LOST TIME		IN	OUT	TIME
MINUTES				
15		6.0 F.1	8.0 F.1	9 <sup>1</sup> / <sub>2</sub>
		8.30 F.1	12.0 F.1	
		1.0 M.1	5.0 M.1	
		6.15 S.2	8.0 S.2	5 <sup>1</sup> / <sub>4</sub>
		8.30 S.2	12.0 S.2	
		6.0 M.4	8.0 M.4	9 <sup>1</sup> / <sub>2</sub>
		8.30 M.4	12.0 M.4	
		1.0 Z.4	5.0 Z.4	
		6.0 TU.5	8.0 TU.5	9 <sup>1</sup> / <sub>2</sub>
		8.30 TU.5	12.0 TU.5	
		1.0 Z.5	5.0 Z.5	
		6.0 W.6	8.0 W.6	9 <sup>1</sup> / <sub>2</sub>
		8.30 W.6	12.0 W.6	
		1.0 Z.6	5.0 Z.6	
		6.0 TH.7	8.0 TH.7	9 <sup>1</sup> / <sub>2</sub>
		8.30 TH.7	12.0 TH.7	
		1.0 Z.7	5.0 Z.7	
Form 53.		Total hours		52 <sup>3</sup> / <sub>4</sub>
		Hours	Mins.	Rate
		52	45	10d. 2 3 11 <sup>3</sup> / <sub>4</sub>
Ordinary Time				Annual
Overtime				
TOTAL				
A.M. indicated by index letter upright. P.M. indicated by index letter sideways.				

# THE GREEN ENGINE

CO., LTD.

:: CONTRACTORS TO ::  
H.M. ADMIRALTY  
AND WAR OFFICE.



12 Cylinder 300 B.H.P. Model.



## 166, PICCADILLY, W.1.

Telegrams: "Aircengine, London"

Telephones: Gerrard 8165; Richmond 1293

EDITORIAL AND ADVERTISEMENT OFFICES, 166, PICCADILLY, W.1.

Printed for THE AEROPLANE AND GENERAL PUBLISHING CO., LTD., by BONNER & CO., The Chancery Lane Press, Rolls Pass  
London, E.C.; and Published by THE WM. DAWSON PUBLISHING COMPANY, LTD., at Rolls House, Breams Buildings, London  
Branches in Canada, Toronto, Montreal, and Winnipeg; in South Africa: Cape Town, Johannesburg, and Durban.



# BROWN BROTHERS' (LTD.) METAL FITTINGS FOR AIRCRAFT

INSPECTION DOOR FRAMES  
Aluminium Pressings of every Description

## SOPWITH F1 FITTINGS IMMEDIATE DELIVERIES

Aileron Hinges  
B2015 . B2016

Drift Strut  
Socket A2001

Top Aileron Control  
Arm Back-  
Plate A2078

Drift Strut  
Socket A2000

Top Aileron Control  
Levers B2013

Bottom Aileron  
Control Lever  
B.2013

Strut Socket A2092



Sopwith F1 Spar Boxes  
All Patterns Supplied



S.L.71 Pulley Duralumin



S.L.276  
Aileron Pulley Bracket



Cable  
Guides  
S.L.220



B.2107  
Holding  
Down  
Ring

ANY CLASS OF METAL  
FITTINGS MADE UP TO DRAWING

### Prompt Deliveries of Metal Fittings

Our organization and experience is at your service. Our workmanship is acknowledged throughout the industry to be of the highest possible finish and accurate in every detail. Our low prices and prompt deliveries will help you exceed your anticipated production.

**BROWN BROTHERS, LTD.,** Great  
Eastern Street, London, E.C. 2. Branches at  
Manchester, Dublin, Paris and Melbourne.

B 2019



METAL  
FITTINGS  
A  
SPECIALITY.

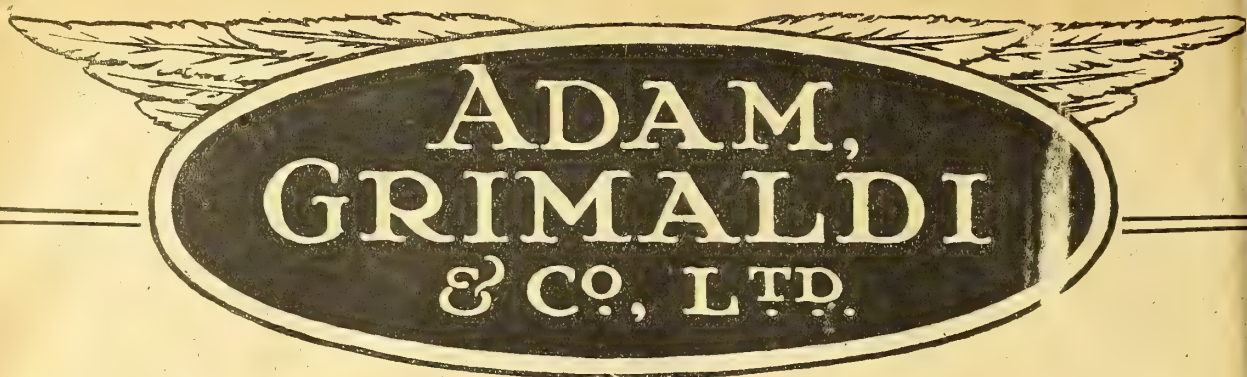
**The Aero Mechanical Co., Ltd.**  
CONTRACTORS TO THE AIR BOARD.  
60-66, ROCHESTER ROW, LONDON, S.W.1.

Telephone:  
Vic. 7570 (3 lines).

Managing Directors:  
E. Salomon, J. Fogelson

Complete Fittings  
and Dies in Stock for  
latest D.H. Machines;  
also most of the Fittings  
for other D.H. Machines  
and Handley-Page.

**Our reputation has been built up by our ability to effect  
deliveries right up to time.**



**AIRCRAFT MANUFACTURERS  
CONTRACTORS TO H.M. GOVERNMENT**



**ALBERT WORKS, GLASSHOUSE STREET,  
ALBERT EMBANKMENT, VAUXHALL, S.E. 11**

Telegrams: "Autocoach, 'Phone, London."

Telephone: Hop 5552 (3 lines)

**THE AIR NAVIGATION COMPANY, LTD.**

**BLERIOT & SPAD  
AIRCRAFT WORKS  
ADDLESTONE, SURREY.**

*Contractors to War Office and Admiralty.*

**FLYING GROUND - BROOKLANDS AERODROME.**

**NORBERT CHEREAU (Managing Director).**

Telegrams—"Bleriot, Weybridge."

Telephone—353 Weybridge.



CONTRACTORS TO H.M. ADMIRALTY & AIR BOARD.

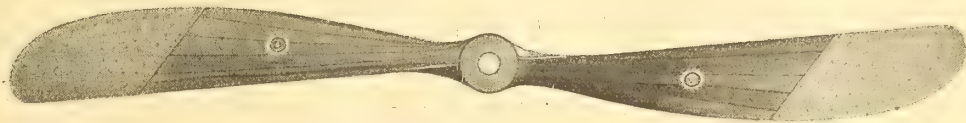
# INTEGRAL PROPELLERS

Hold the World's Records

and are indisputably the

## BEST and MOST EFFICIENT

PATENTED IN ENGLAND IN 1909 THEY HAVE BEEN  
**FIRST AND FOREMOST EVER SINCE.**



### THE INTEGRAL PROPELLER COMPANY, LTD.,

is the Firm with the largest output

FACTORIES AT  
**HENDON, N.W.9.                      HIGH WYCOMBE (Bucks).**  
**TOOTING, S.W.**

*Registered Offices:—*

THE INTEGRAL PROPELLER COMPANY, Limited,  
Edgware Road, The Hyde, ————— Hendon, N.W.9

Telegrams: AVIPROP, HYDE, LONDON.

Telephone: KINGSBURY 104.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

# GNÔME & LE RHONE ENGINE COMPANY

Contractors to the  
War Office and Admiralty

London Offices :

47, VICTORIA STREET, S.W.1., and THE HYDE, HENDON, N.W.9.

Works: Blackhorse Lane, Walthamstow.



# PROPELLERS ONLY



CONTRACTORS TO  
H.M. GOVERNMENT

Office and Works :  
Propeller Works,  
Balm Road,  
Hunslet,  
Leeds.

Telephone—  
Central 291.  
Telegrams—  
Airscrews, Leeds.

# SUNBEAM-COATALEN AIRCRAFT MOTORS

---

---

CONTRACTORS TO H.M.  
ADMIRALTY, RUSSIAN &  
FRENCH GOVERNMENTS

---

---

**The SUNBEAM MOTOR CAR CO. Ltd.**  
Head Office and Works . . . . . WOLVERHAMPTON



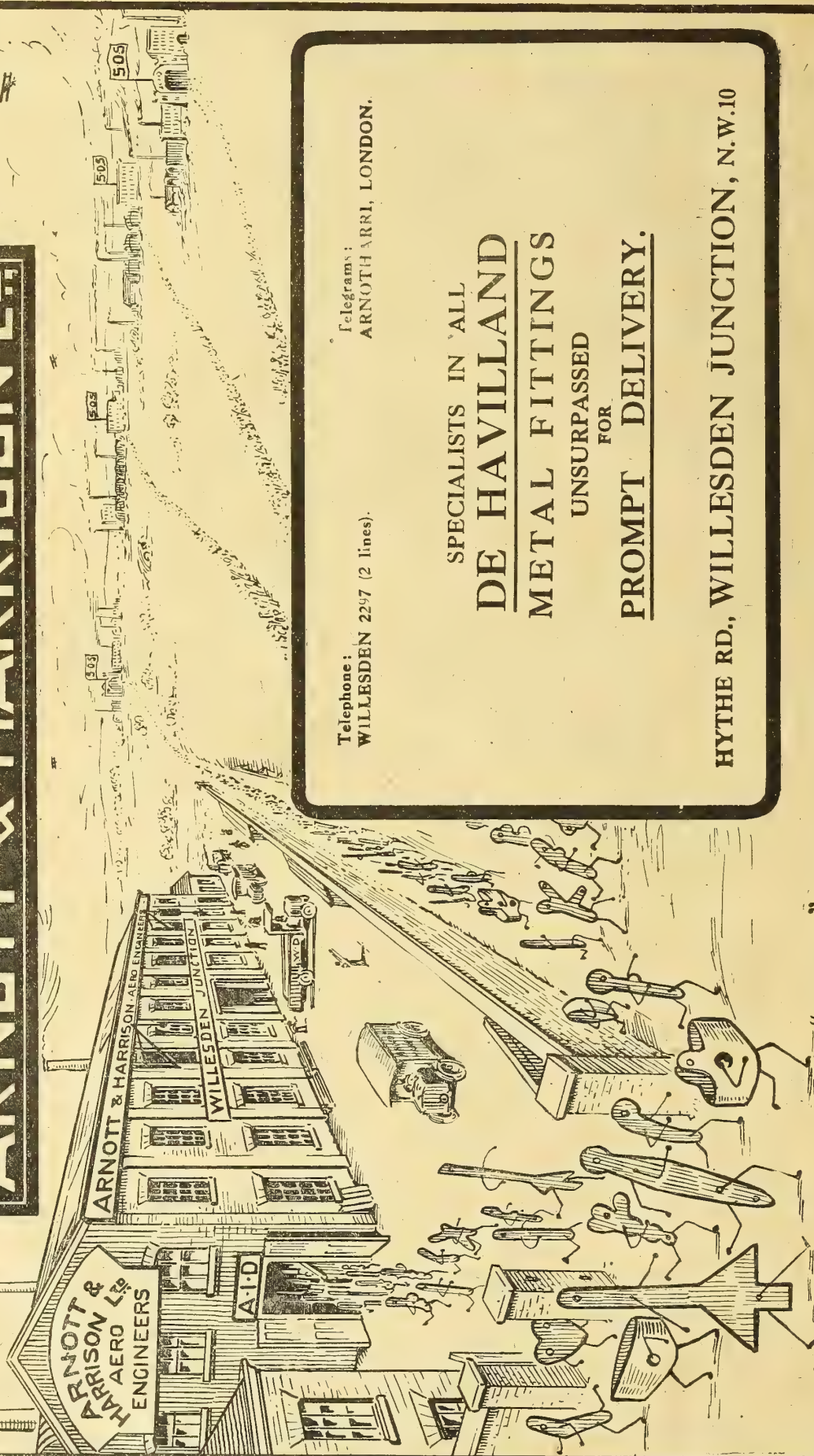
# London Aircraft Co.

Contractors to War Office  
. . and Air Board. . .

**Stampings, Machinery,  
Ashbends, Spars, and  
. Whole Components .**

**URSWICK RD., LOWER CLAPTON.**

# ARNOTT-&-HARRISON LTD.



Telephone:  
WILLESDEN 2257 (2 lines).

Telegrams:  
ARNOTHARRI, LONDON.

SPECIALISTS IN ALL  
**DE HAVILLAND**  
**METAL FITTINGS**  
UNSURPASSED  
FOR  
**PROMPT DELIVERY.**

HYTHE RD., WILLESDEN JUNCTION, N.W.10

"A & H" SMALL PARTS TO THE RESCUE.



**ON A PLANE  
BY ITSELF**



Telephone:  
AVENUE 3178.

Telegrams:  
XCROIDEN, WAPP, LONDON.

**THE WORLD'S STRONGEST GLUE**

**USED COLD**

"Approved" by H.M. Admiralty and War Office and A.I.D., and employed by the Leading Manufacturers of Aeroplanes, Seaplanes and Propellers.

"STANDARD" STRENGTH FOR RIBS, ETC. (Class 2 work).

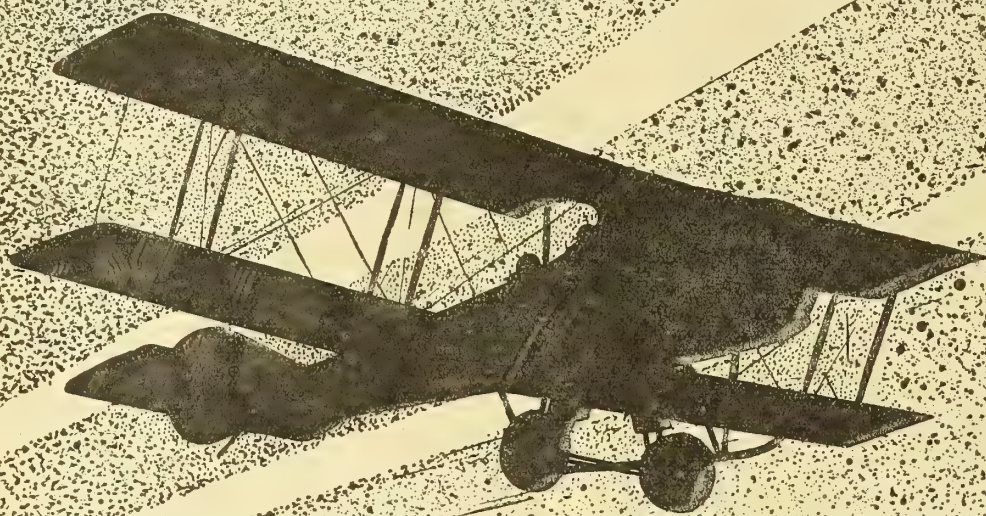
"EXTRA" STRENGTH FOR PROPELLERS, SPARS, ETC. (Class 1 work).

Sole Manufacturers:

**THE IMPROVED LIQUID GLUES COMPANY, LIMITED,**  
GREAT HERMITAGE STREET, LONDON, E.1.

**CONTRACTORS TO H.M. GOVERNMENT**





# AVRO

## NOTHING BETTER

### AVROE & CO. LTD.

TELEGRAMS.  
TRIPLANE

MANCHESTER

TELEPHONE  
CITY 6371

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# The AEROPLANE

The Editorial and Advertising Offices of "The Aeroplane" are at 166, Piccadilly, London W.1.  
 Telegraphic Address: "Aileron, London." Telephone: Mayfair, 5407.  
 Accounts, and all correspondence relating thereto, should be sent to the Registered Offices of  
 The Aeroplane and General Publishing Co., Ltd., Rolls House, Breems Buildings, E.C.4.  
 Subscription Rates, post free: Home, 3 months, 8s. 10d. 6 months, 7s. 7d.; 12 months 15s. 2d.  
 Foreign, 3 months, 5s. 0d.; 6 months, 10s. 0d.; 12 months, 20s. 0d. Canada, 1 Year, \$4.70c.  
 U.S.A., 1 Year, \$5.20c.

## THE REVIEW OF THE YEAR.—II.

### JULY.

**Naval.**—On July 2nd, Sir Samuel Evans, presiding over the Prize Court, considered the first claim for prize money in which aviators were concerned. The claim was for awards for the destruction of the German cruiser "Königsberg," and the President of the Court held that the aviators and mechanics who assisted in the destruction of the "Königsberg" were entitled to their share of the prize money along with the officers and ratings of the ships concerned.

On July 9th a Naval aeroplane, subsequently announced to be a Handley Page with Rolls-Royce engines, commanded by Flt. Comdr. Savory, R.N., with Flt. Lt. McClelland as second pilot, and Lt. Rawlings, R.N.V.R., as engineer officer, bombed the German battleship "Goeben," lying off Constantinople, and also bombed the Turkish War Office with good results. An oil pipe was damaged by a lucky shot while the machine was low down over Constantinople, and it returned to its base in the Balkans with one engine only working. This was the machine which caused so much excitement on its arrival in Rome some weeks earlier, and it is noteworthy that throughout its journey from London to Constantinople the machine flew absolutely to schedule time.

On July 12th it was announced that the R.N.A.S. had made numerous raids on a big scale on German aerodromes in Flanders. This was the beginning of a regular series, and the particular occasion was in preparation for the Army's attack on the German position in Flanders.

**Military.**—Sir Archibald Murray's dispatch concerning operations in Egypt from Oct. 1st, 1916, to Feb. 28th, 1917, was published on July 4th, and in it there were several mentions of the good work done by the R.F.C., and special reference was made to the work of the Australians in the Corps.

A G.H.Q. communiqué of the 8th noted that hostile aircraft were working in large formations—a species of aerial warfare which was subsequently fully developed, as was shown by later results of air fights. On this particular day six German machines were brought down in combat, and 10 more were forced down out of control, and eight of our machines were logged as missing.

On July 10th there was published a dispatch from Sir Stanley Maude, commanding in Mesopotamia, covering the period from Aug. 28th, 1916, to March 31st, 1917. In this dispatch special tribute was paid to the work of the R.F.C. in Mesopotamia.

On the 13th another dispatch from Viscount Buxton on operations carried on from Rhodesia also referred to the R.F.C.

On the 20th Brigadier-General Branker, then Deputy-Director General of Military Aeronautics, was promoted to Major-General.

The reference to hostile aircraft working in large formations, which appeared on July 8th, was followed by a communiqué on July 27th, regarding very heavy air fighting, in which 15 German machines were definitely destroyed, and 16 driven down out of control. In the course of this fighting, bombs were dropped 40 miles behind the enemy's lines, and, in spite of this, only three British machines were missing.

On the following day, July 28th, 16 German machines were crashed, and 14 driven down out of control, as well as two balloons being sunk. On this occasion 13 British machines were missing.

It was about this period that the R.F.C. began to receive in something like quantities machines of better quality than anything they had had previously with the result that, though on occasion the Corps' losses were heavy, it has been more than able to hold its own against the Germans.

**Home Affairs.**—On July 4th twelve or fourteen Gothas dropped bombs on Harwich, killing eight people and injuring 22.

On July 7th 22 Gothas, led by Capt. Kleine, came over London, killing 59 people and injuring 103. One German machine was shot down, and the Germans shot down one of ours.

On July 9th a secret session of the House of Commons was held to consider the question of air raids. Nothing particular was disclosed as to the result of the proceedings, but it is of interest to note that consideration of their own safety and of the danger to their seats in Parliament, owing to the perturbation of their constituents, induced our elected legislators to take quite a lively interest in aeronautics.

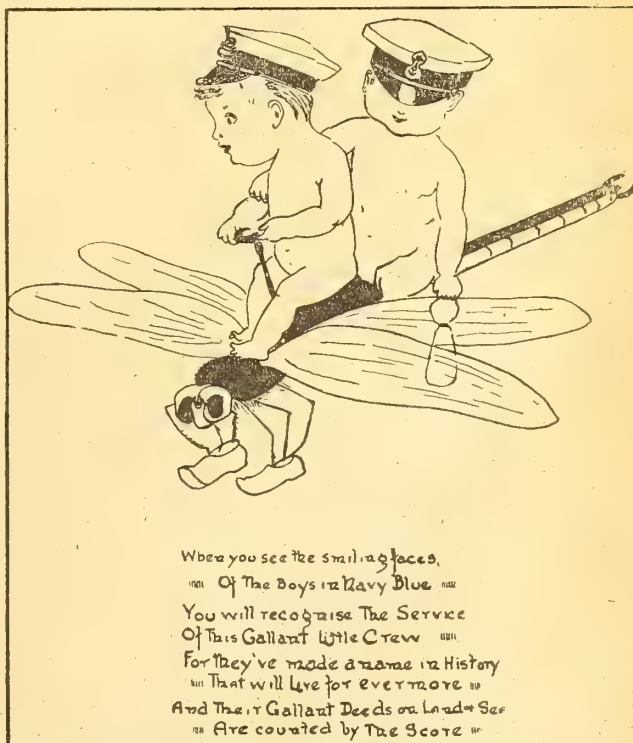
One result of the agitation was to induce the Authorities to issue warnings of the approach of enemy aircraft by exploding maroons. The first of these official warnings was given on July 14th, and turned out to be a false alarm.

Another effect of the German raids was that on July 13th the London M.P.'s went as a deputation to Mr. Lloyd George, who apparently proceeded to make to them the particular kind of speech which is found so soothing by his admirers.

On July 20th Mr. Winston Churchill was sworn in as Minister of Munitions. His appointment raised the usual outcry from his hereditary enemies, but the increased activity of his Department soon bore witness to the suitability of his appointment.

Another considerable air raid took place on July 22nd when a number of Gothas, variously estimated between 15 and 22 came over Harwich and London, killing 13 and injuring 26—one of the German machines was shot down.

On July 25th a charge of receiving illegally money on Government contracts was made against Commander J. Porte, R.N., the designer and producer of the highly successful Porte flying-boat, against his lawyer, Mr. Casson, and against Mr. Lyman J. Seely, of the Curtiss Company. The charge was that Commander Porte and Mr. Casson had conspired with Mr. Seely to



An Allegorical Design from "The Flypaper," an R.N.A.S. Publication from the North.



take illegal commission on American contracts from the Curtiss Company. The action was carried on for a long time, and, finally, the charge against Commander Porte was withdrawn on his consenting to refund all the profits he had received from the Curtiss Company, with the exception of £10,000, which he had settled elsewhere. Mr. Casson was fined a sum roughly equivalent to the amount he had received as his share of the profits. Mr. Seely did not appear for trial. It is well to remember in connection with this case that the sums in question were paid by the Curtiss Company as the result of an agreement made a considerable time before the war when Commander Porte was not in the Service.

On the 25th Mr. Macpherson, in replying to a question by Mr. Pemberton-Billing, stated that since the outbreak of war 47 airship raids and 30 aeroplane raids had been made by the enemy on this country.

On the 27th Mr. Holman, Premier of New South Wales, who was largely responsible for the founding of the New South Wales Flying School at Richmond, near Sydney, paid a visit to the Aircraft Manufacturing Company, and it is hoped that the result of his visit will be to increase the equipment for the Australian School.

On the 30th Sir George Cave, Home Secretary, said that from the commencement of the war to that date 366 people had been killed in air raids, against 2,412 killed in street accidents, and that 1,092 had been injured in air raids, against 70,863 injured in street accidents. The argument appears conclusive till one considers that air raids had taken place on 77 days, whereas there had been roughly 1,100 days on which street accidents could occur. It is obvious that an increase in the number of raids would materially alter the proportion of casualties.

**Foreign Affairs.**—On July 6th Serjt.-Maj. Gallois bombed Essen, covering the 440 miles from his starting-place to Essen and back between 9.20 p.m. and 4.15 a.m. On the same night the French Aviation Service dropped 13½ tons of bombs on German positions, and lost two machines in doing so.

A message from China recorded that on July 7th an aeroplane in the service of the Chinese rebels dropped a bomb on Peking, whereupon the Emperor abdicated. It is not expected that a similar result will ensue from dropping a bomb on Berlin, or even several bombs.

During the month an interesting show of captured German and Austrian aeroplanes was held at Milan by the Italian Government to educate Italian aircraft constructors, and to enthrone the Italian people. A similar show with similar objects was held in Berlin, the exhibits being sundry aeroplanes of the Allies. Nothing on a similar scale has so far been attempted in this country, though towards the end of the year an effort was made to assist British aeroplane designers to acquire knowledge of German manufacturing methods.

On the 26th and 28th some particularly important night-bombing operations were carried out by Italian airships, and it is worthy of note that throughout the war, the Italian Airship Service has done exceedingly fine work.

During July an American Mission visited the chief Italian aviation centres, and it was recorded that the huge Caproni bi-planes looped the loop in a stately manner for the edification of our new Allies.

On the 27th and 29th German aeroplanes attempted to raid Paris, but apparently the results, which were practically nil, did not encourage the enemy to continue.

#### AUGUST.

**Naval.**—During August the R.N.A.S. continued its bombing of German aerodromes in Flanders with good results, but there was no outstanding feature which calls for special mention.

On the 21st a Zeppelin was destroyed off Jutland, and it is understood that Naval aircraft played a part in the operations.

On the 22nd the Admiralty, naturally anxious to show that the R.N.A.S. on home stations were justifying their existence, published a report of the doings of Naval aircraft against Gotha raiders in the recent raids, this report being, it was stated, in amplification of Lord French's report of the same day.

**Military.**—On August 1st occurred the first mention in the daily Press of the R.F.C. acting as "Cavalry of the Air" at the Battle of Ypres. It may be recalled that the use of aeroplanes as third dimension cavalry had been discussed in this paper something over a year earlier. Mr. Philip Gibbs also recorded the first battle between a German aeroplane and a British tank.

On the 6th Mr. Bean, the War Correspondent with the Australian Forces during the Battle of Ypres, first recorded the low-flying tactics of German aeroplanes in imitation of the aerial cavalry operations of the British aviators.

On the 11th the "Gazette" recorded the award of the Victoria Cross to Capt. W. A. Bishop, D.S.O., M.C., Canadian Cavalry, for single-handed attacks on German aerodromes far behind the lines. Capt. Bishop thus became the first Canadian officer to hold all three distinctions.

On the 13th Maj. R. E. T. Hogg, Indian Cavalry, was gazetted to be Brig.-General.

On the 14th the G.H.Q. communiqué recorded renewed aggressive tactics on the part of the enemy, and in the week from the 14th to the 20th inclusive, the loss of 49 British machines was admitted. Against this the R.F.C. claimed, on unimpeachable evidence, 111 German machines, as either actually crashed or as driven down out of control.

Communiqués from the G.O.C. in Palestine on Aug. 28th and 29th mention bombing operations by the R.F.C.—this being the opening of new and satisfactory operations in that war area.

On the 28th Capt. G. C. Hoare, Ind. Cav., was gazetted to be Brig.-General.

**Home Affairs.**—By the courtesy of the French technical journal, "L'Aerophile," this paper was able to publish on Aug. 1st accurate descriptions of several of the latest types of German fighting machines. On the same date was also published the annual report of the Advisory Committee for Aeronautics.

On the 13th there was another Gotha raid on Harwich and Southend, which was promptly repelled by the Home Defence squadrons. There were 32 killed and 43 injured.

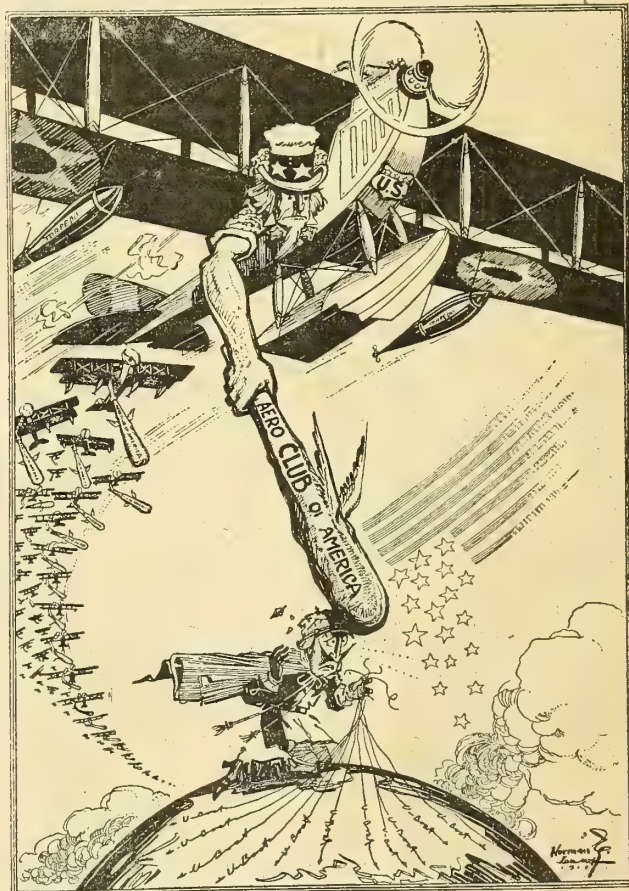
On the 15th the "Daily Chronicle" recorded the indignation of the people of Southend at the absence of warning of the raid on the 13th in view of the fact that the warning was received by the Southend police half an hour before the raiders actually reached Southend. The circumstance is more reprehensible in that outside the London area each town is supposed to make its own arrangements for giving warnings.

On the 24th the "London Gazette" recorded the creation of the "Order of the British Empire." Several people more or less concerned with aviation were included in the first list of beneficiaries, but none of the pioneers of aviation appeared in the list, nor any of those directly responsible for aeronautical progress.

On the 29th the second annual general meeting of the Society of British Aircraft Constructors was held, when a highly satisfactory state of affairs was disclosed. In its short period of existence the Society has done excellent work for the consolidation and protection of the British Aircraft Industry, and the high service rendered by the Chairman, Mr. H. White Smith, and by the Secretary, Mr. Charles V. Allen, was recognised by their election for a further period of office.

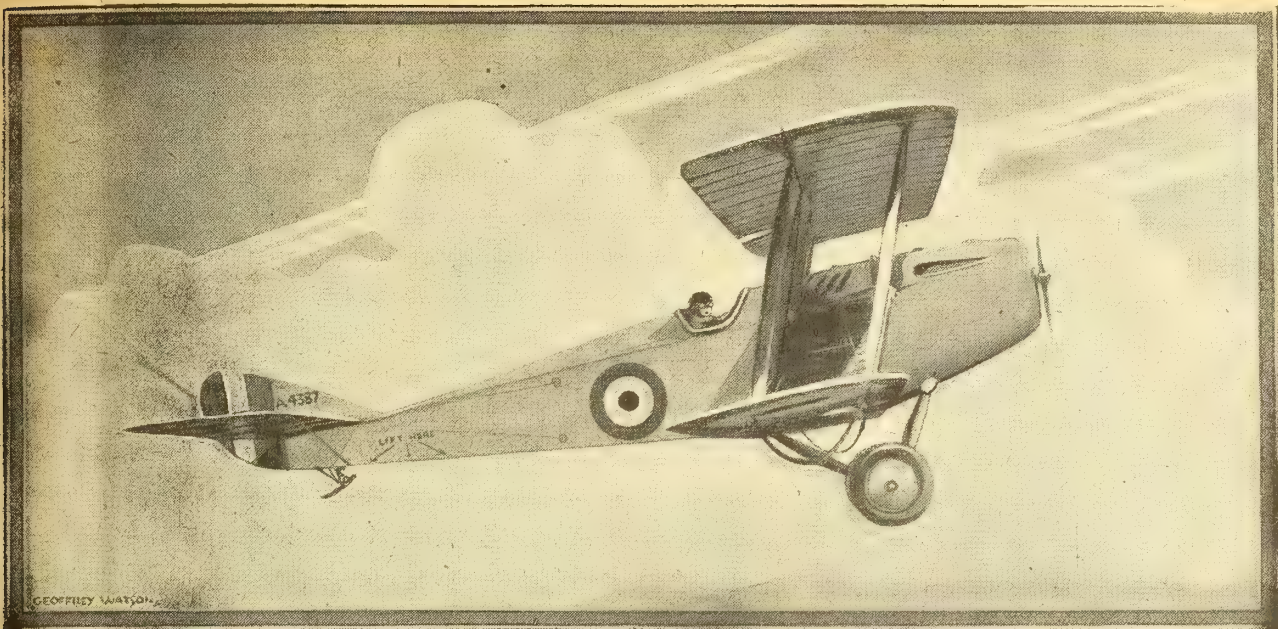
**Foreign Affairs.**—On August 1st the 50th aerial victory of Captain Guynemer, of the French Aviation Service, was recorded.

A Russian communiqué of the 2nd recorded the dropping of bombs by 24 machines. This was the last mention of any considerable activity by Russian aircraft since the downfall of Russia, and the deposition of His Imperial Majesty the Czar.

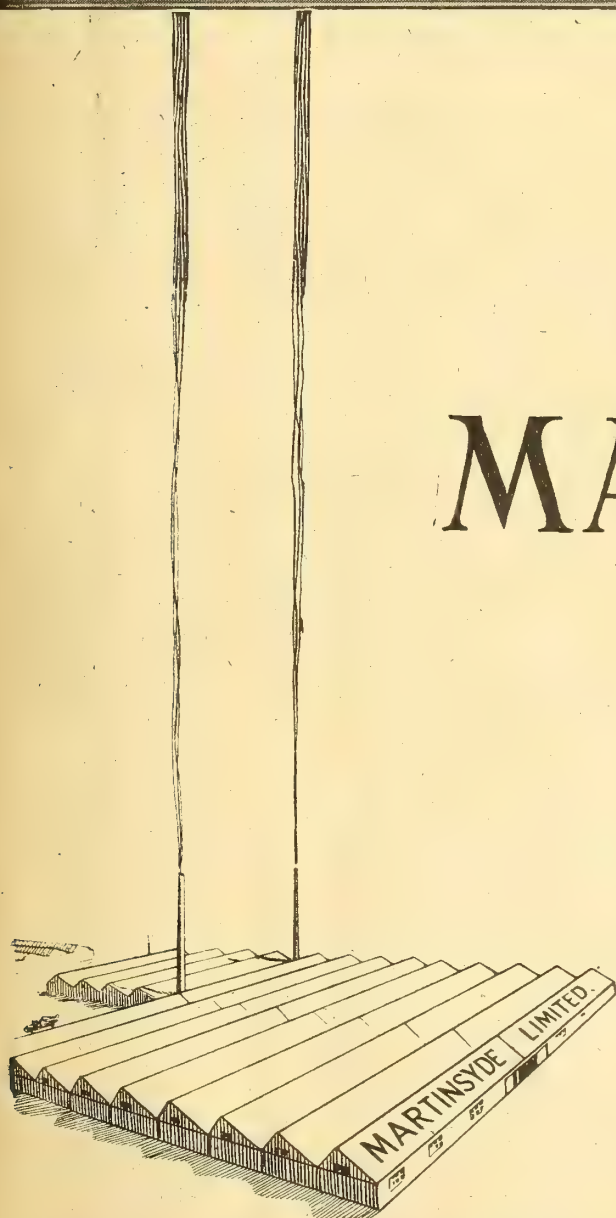


A New Year Greeting from the Aero Club of America.





# MARTINSYDE



Aerodrome - and  
 Auxiliary Works:  
 BROOKLANDS.  
 Head Office  
 & Works:  
 WOKING, Surrey.





# "Ascol" Service

WE MAY HAVE THAT PART  
Consult our regular

FOR PRICES, STOCKS AND DELIVERIES of all A.G.S. BOLTS and NUTS and after Approval Parts on the A.G.S. Standard for Screw Threads and Bolt Heads and Nuts. Write to the Royal Aircraft Factory, Farnborough, Hants. or to the A.G.S. Standard Committee, London, W.C. and an application.

# A.G.S. STANDARD HEX. BOLTS AND NUTS, EYEBOLTS AND STUDS

## COMPLETE CHART, GIVING ALL DIMENSIONS AND DETAILS, INCLUDING THE A.G.S. STANDARD FOR SCREW THREADS AND BOLT HEADS AND NUTS.

### COMPLETE TABLE OF SIZES FOR EYEBOLTS STUDS, HEX BOLTS & NUTS & SCREW THREADS TO A.G.S. STANDARD (ROYAL AIRCRAFT FACTORY)

STUDS		EYEBOLTS		A.G.S. BOLTS		A.G.S. NUTS		SCREW THREADS		HEX NUTS & BOLT HEADS (RANGE)	
Size	Length of Thread	Size	Length of Thread	Size	Length of Thread	Size	Length of Thread	Size	Length of Thread	Size	Length of Thread
1/4"	1 1/2"	1/4"	1 1/2"	1/4"	1 1/2"	1/4"	1 1/2"	1/4"	1 1/2"	1/4"	1 1/2"
3/8"	2"	3/8"	2"	3/8"	2"	3/8"	2"	3/8"	2"	3/8"	2"
1/2"	2 1/2"	1/2"	2 1/2"	1/2"	2 1/2"	1/2"	2 1/2"	1/2"	2 1/2"	1/2"	2 1/2"
5/8"	3"	5/8"	3"	5/8"	3"	5/8"	3"	5/8"	3"	5/8"	3"
3/4"	3 1/2"	3/4"	3 1/2"	3/4"	3 1/2"	3/4"	3 1/2"	3/4"	3 1/2"	3/4"	3 1/2"
7/8"	4"	7/8"	4"	7/8"	4"	7/8"	4"	7/8"	4"	7/8"	4"
1"	4 1/2"	1"	4 1/2"	1"	4 1/2"	1"	4 1/2"	1"	4 1/2"	1"	4 1/2"
1 1/8"	5"	1 1/8"	5"	1 1/8"	5"	1 1/8"	5"	1 1/8"	5"	1 1/8"	5"
1 1/4"	5 1/2"	1 1/4"	5 1/2"	1 1/4"	5 1/2"	1 1/4"	5 1/2"	1 1/4"	5 1/2"	1 1/4"	5 1/2"
1 1/2"	6"	1 1/2"	6"	1 1/2"	6"	1 1/2"	6"	1 1/2"	6"	1 1/2"	6"
1 3/4"	6 1/2"	1 3/4"	6 1/2"	1 3/4"	6 1/2"	1 3/4"	6 1/2"	1 3/4"	6 1/2"	1 3/4"	6 1/2"
2"	7"	2"	7"	2"	7"	2"	7"	2"	7"	2"	7"
2 1/4"	7 1/2"	2 1/4"	7 1/2"	2 1/4"	7 1/2"	2 1/4"	7 1/2"	2 1/4"	7 1/2"	2 1/4"	7 1/2"
2 1/2"	8"	2 1/2"	8"	2 1/2"	8"	2 1/2"	8"	2 1/2"	8"	2 1/2"	8"
2 3/4"	8 1/2"	2 3/4"	8 1/2"	2 3/4"	8 1/2"	2 3/4"	8 1/2"	2 3/4"	8 1/2"	2 3/4"	8 1/2"
3"	9"	3"	9"	3"	9"	3"	9"	3"	9"	3"	9"
3 1/4"	9 1/2"	3 1/4"	9 1/2"	3 1/4"	9 1/2"	3 1/4"	9 1/2"	3 1/4"	9 1/2"	3 1/4"	9 1/2"
3 1/2"	10"	3 1/2"	10"	3 1/2"	10"	3 1/2"	10"	3 1/2"	10"	3 1/2"	10"
3 3/4"	10 1/2"	3 3/4"	10 1/2"	3 3/4"	10 1/2"	3 3/4"	10 1/2"	3 3/4"	10 1/2"	3 3/4"	10 1/2"
4"	11"	4"	11"	4"	11"	4"	11"	4"	11"	4"	11"
4 1/4"	11 1/2"	4 1/4"	11 1/2"	4 1/4"	11 1/2"	4 1/4"	11 1/2"	4 1/4"	11 1/2"	4 1/4"	11 1/2"
4 1/2"	12"	4 1/2"	12"	4 1/2"	12"	4 1/2"	12"	4 1/2"	12"	4 1/2"	12"
4 3/4"	12 1/2"	4 3/4"	12 1/2"	4 3/4"	12 1/2"	4 3/4"	12 1/2"	4 3/4"	12 1/2"	4 3/4"	12 1/2"
5"	13"	5"	13"	5"	13"	5"	13"	5"	13"	5"	13"
5 1/4"	13 1/2"	5 1/4"	13 1/2"	5 1/4"	13 1/2"	5 1/4"	13 1/2"	5 1/4"	13 1/2"	5 1/4"	13 1/2"
5 1/2"	14"	5 1/2"	14"	5 1/2"	14"	5 1/2"	14"	5 1/2"	14"	5 1/2"	14"
5 3/4"	14 1/2"	5 3/4"	14 1/2"	5 3/4"	14 1/2"	5 3/4"	14 1/2"	5 3/4"	14 1/2"	5 3/4"	14 1/2"
6"	15"	6"	15"	6"	15"	6"	15"	6"	15"	6"	15"
6 1/4"	15 1/2"	6 1/4"	15 1/2"	6 1/4"	15 1/2"	6 1/4"	15 1/2"	6 1/4"	15 1/2"	6 1/4"	15 1/2"
6 1/2"	16"	6 1/2"	16"	6 1/2"	16"	6 1/2"	16"	6 1/2"	16"	6 1/2"	16"
6 3/4"	16 1/2"	6 3/4"	16 1/2"	6 3/4"	16 1/2"	6 3/4"	16 1/2"	6 3/4"	16 1/2"	6 3/4"	16 1/2"
7"	17"	7"	17"	7"	17"	7"	17"	7"	17"	7"	17"
7 1/4"	17 1/2"	7 1/4"	17 1/2"	7 1/4"	17 1/2"	7 1/4"	17 1/2"	7 1/4"	17 1/2"	7 1/4"	17 1/2"
7 1/2"	18"	7 1/2"	18"	7 1/2"	18"	7 1/2"	18"	7 1/2"	18"	7 1/2"	18"
7 3/4"	18 1/2"	7 3/4"	18 1/2"	7 3/4"	18 1/2"	7 3/4"	18 1/2"	7 3/4"	18 1/2"	7 3/4"	18 1/2"
8"	19"	8"	19"	8"	19"	8"	19"	8"	19"	8"	19"
8 1/4"	19 1/2"	8 1/4"	19 1/2"	8 1/4"	19 1/2"	8 1/4"	19 1/2"	8 1/4"	19 1/2"	8 1/4"	19 1/2"
8 1/2"	20"	8 1/2"	20"	8 1/2"	20"	8 1/2"	20"	8 1/2"	20"	8 1/2"	20"
8 3/4"	20 1/2"	8 3/4"	20 1/2"	8 3/4"	20 1/2"	8 3/4"	20 1/2"	8 3/4"	20 1/2"	8 3/4"	20 1/2"
9"	21"	9"	21"	9"	21"	9"	21"	9"	21"	9"	21"
9 1/4"	21 1/2"	9 1/4"	21 1/2"	9 1/4"	21 1/2"	9 1/4"	21 1/2"	9 1/4"	21 1/2"	9 1/4"	21 1/2"
9 1/2"	22"	9 1/2"	22"	9 1/2"	22"	9 1/2"	22"	9 1/2"	22"	9 1/2"	22"
9 3/4"	22 1/2"	9 3/4"	22 1/2"	9 3/4"	22 1/2"	9 3/4"	22 1/2"	9 3/4"	22 1/2"	9 3/4"	22 1/2"
10"	23"	10"	23"	10"	23"	10"	23"	10"	23"	10"	23"
10 1/4"	23 1/2"	10 1/4"	23 1/2"	10 1/4"	23 1/2"	10 1/4"	23 1/2"	10 1/4"	23 1/2"	10 1/4"	23 1/2"
10 1/2"	24"	10 1/2"	24"	10 1/2"	24"	10 1/2"	24"	10 1/2"	24"	10 1/2"	24"
10 3/4"	24 1/2"	10 3/4"	24 1/2"	10 3/4"	24 1/2"	10 3/4"	24 1/2"	10 3/4"	24 1/2"	10 3/4"	24 1/2"
11"	25"	11"	25"	11"	25"	11"	25"	11"	25"	11"	25"
11 1/4"	25 1/2"	11 1/4"	25 1/2"	11 1/4"	25 1/2"	11 1/4"	25 1/2"	11 1/4"	25 1/2"	11 1/4"	25 1/2"
11 1/2"	26"	11 1/2"	26"	11 1/2"	26"	11 1/2"	26"	11 1/2"	26"	11 1/2"	26"
11 3/4"	26 1/2"	11 3/4"	26 1/2"	11 3/4"	26 1/2"	11 3/4"	26 1/2"	11 3/4"	26 1/2"	11 3/4"	26 1/2"
12"	27"	12"	27"	12"	27"	12"	27"	12"	27"	12"	27"
12 1/4"	27 1/2"	12 1/4"	27 1/2"	12 1/4"	27 1/2"	12 1/4"	27 1/2"	12 1/4"	27 1/2"	12 1/4"	27 1/2"
12 1/2"	28"	12 1/2"	28"	12 1/2"	28"	12 1/2"	28"	12 1/2"	28"	12 1/2"	28"
12 3/4"	28 1/2"	12 3/4"	28 1/2"	12 3/4"	28 1/2"	12 3/4"	28 1/2"	12 3/4"	28 1/2"	12 3/4"	28 1/2"
13"	29"	13"	29"	13"	29"	13"	29"	13"	29"	13"	29"
13 1/4"	29 1/2"	13 1/4"	29 1/2"	13 1/4"	29 1/2"	13 1/4"	29 1/2"	13 1/4"	29 1/2"	13 1/4"	29 1/2"
13 1/2"	30"	13 1/2"	30"	13 1/2"	30"	13 1/2"	30"	13 1/2"	30"	13 1/2"	30"
13 3/4"	30 1/2"	13 3/4"	30 1/2"	13 3/4"	30 1/2"	13 3/4"	30 1/2"	13 3/4"	30 1/2"	13 3/4"	30 1/2"
14"	31"	14"	31"	14"	31"	14"	31"	14"	31"	14"	31"
14 1/4"	31 1/2"	14 1/4"	31 1/2"	14 1/4"	31 1/2"	14 1/4"	31 1/2"	14 1/4"	31 1/2"	14 1/4"	31 1/2"
14 1/2"	32"	14 1/2"	32"	14 1/2"	32"	14 1/2"	32"	14 1/2"	32"	14 1/2"	32"
14 3/4"	32 1/2"	14 3/4"	32 1/2"	14 3/4"	32 1/2"	14 3/4"	32 1/2"	14 3/4"	32 1/2"	14 3/4"	32 1/2"
15"	33"	15"	33"	15"	33"	15"	33"	15"	33"	15"	33"
15 1/4"	33 1/2"	15 1/4"	33 1/2"	15 1/4"	33 1/2"	15 1/4"	33 1/2"	15 1/4"	33 1/2"	15 1/4"	33 1/2"
15 1/2"	34"	15 1/2"	34"	15 1/2"	34"	15 1/2"	34"	15 1/2"	34"	15 1/2"	34"
15 3/4"	34 1/2"	15 3/4"	34 1/2"	15 3/4"	34 1/2"	15 3/4"	34 1/2"	15 3/4"	34 1/2"	15 3/4"	34 1/2"
16"	35"	16"	35"	16"	35"	16"	35"	16"	35"	16"	35"
16 1/4"	35 1/2"	16 1/4"	35 1/2"	16 1/4"	35 1/2"	16 1/4"	35 1/2"	16 1/4"	35 1/2"	16 1/4"	35 1/2"
16 1/2"	36"	16 1/2"	36"	16 1/2"	36"	16 1/2"	36"	16 1/2"	36"	16 1/2"	36"
16 3/4"	36 1/2"	16 3/4"	36 1/2"	16 3/4"	36 1/2"	16 3/4"	36 1/2"	16 3/4"	36 1/2"	16 3/4"	36 1/2"
17"	37"	17"	37"	17"	37"	17"	37"	17"	37"	17"	37"
17 1/4"	37 1/2"	17 1/4"	37 1/2"	17 1/4"	37 1/2"	17 1/4"	37 1/2"	17 1/4"	37 1/2"	17 1/4"	37 1/2"
17 1/2"	38"	17 1/2"	38"	17 1/2"	38"	17 1/2"	38"	17 1/2"	38"	17 1/2"	38"
17 3/4"	38 1/2"	17 3/4"	38 1/2"	17 3/4"	38 1/2"	17 3/4"	38 1/2"	17 3/4"	38 1/2"	17 3/4"	38 1/2"
18"	39"	18"	39"	18"	39"	18"	39"	18"	39"	18"	39"
18 1/4"	39 1/2"	18 1/4"	39 1/2"	18 1/4"	39 1/2"	18 1/4"	39 1/2"	18 1/4"	39 1/2"	18 1/4"	39 1/2"
18 1/2"	40"	18 1/2"	40"	18 1/2"	40"	18 1/2"	40"	18 1/2"	40"	18 1/2"	40"
18 3/4"	40 1/2"	18 3/4"	40 1/2"	18 3/4"	40 1/2"	18 3/4"	40 1/2"	18 3/4"	40 1/2"	18 3/4"	40 1/2"
19"	41"	19"	41"	19"	41"	19"	41"	19"	41"	19"	41"
19 1/4"	41 1/2"	19 1/4"	41 1/2"	19 1/4"	41 1/2"	19 1/4"	41 1/2"	19 1/4"	41 1/2"	19 1/4"	41 1/2"
19 1/2"	42"	19 1/2"	42"	19 1/2"	42"	19 1/2"	42"	19 1/2"	42"	19 1/2"	42"
19 3/4"	42 1/2"	19 3/4"	42 1/2"	19 3/4"	42 1/2"	19 3/4"	42 1/2"	19 3/4"	42 1/2"	19 3/4"	42 1/2"
20"	43"	20"	43"	20"	43"	20"	43"	20"	43"	20"	43"
20 1/4"	43 1/2"	20 1/4"	43 1/2"	20 1/4"	43 1/2"	20 1/4"	43 1/2"	20 1/4"	43 1/2"	20 1/4"	43 1/2"
20 1/2"	44"	20 1/2"	44"	20 1/2"	44"	20 1/2"	44"	20 1/2"	44"	20 1/2"	44"
20 3/4"	44 1/2"	20 3/4"	44 1/2"	20 3/4"	44 1/2"	20 3/4"	44 1/2"	20 3/4"	44 1/2"	20 3/4"	44 1/2"
21"	45"	21"	45"	21"	45"	21"	45"	21"	45"	21"	45"
21 1/4"	45 1/2"	21 1/4"	45 1/2"	21 1/4"	45 1/2"	21 1/4"	45 1/2"	21 1/4"	45 1/2"	21 1/4"	45 1/2"
21 1/2"	46"	21 1/2"	46"	21 1/2"	46"	21 1/2"	46"	21 1/2"	46"	21 1/2"	46"
21 3/4"	46 1/2"	21 3/4"	46 1/2"	21 3/4"	46 1/2"	21 3/4"	46 1/2"	21 3/4"	46 1/2"	21 3/4"	46 1/2"
22"	47"	22"	47"	22"	47"	22"	47"	22"	47"	22"	47"
22 1/4"	47 1/2"	22 1/4"	47 1/2"	22 1/4"	47 1/2"	22 1/4"	47 1/2"	22 1/4"	47 1/2"	22 1/4"	47 1/2"
22 1/2"	48"	22 1/2"	48"	22 1/2"	48"	22 1/2"	48"	22 1/2"	48"	22 1/2"	48"
22 3/4"	48 1/2"	22 3/4"	48 1/2"	22 3/4"	48 1/2"	22 3/4"	48 1/2"	22 3/4"	48 1/2"	22 3/4"	48 1/2"
23"	49"	23"	49"	23"	49"	23"	49"	23"	49"	23"	49"
23 1/4"	49 1/2"	23 1/4"	49 1/2"	23 1/4"	49 1/2"	23 1/4"	49 1/2"	23 1/4"	49 1/2"	23 1/4"	49 1/2"
23 1/2"	50"	23 1/2"	50"	23 1/2"	50"	23 1/2"	50"	23 1/2"	50"	23 1/2"	50"
23 3/4"	50 1/2"	23 3/4"	50 1/2"	23 3/4"	50 1/2"	23 3/4"	50 1/2"	23 3/4"	50 10		





# Can Supply It !!

THAT IS HOLDING YOU UP!  
Stock List.



1. Rafwires (A.G.S.)
2. Slotted Hex. Nuts
3. Hex. Nuts (A.G.S.)
4. Wire Ferrules
5. Splices (Admiralty)
6. Wing Flap Hinges (Drawing 4029)
8. 100-ton Pins (A.G.S. 137)
9. Washers (A.G.S. 160)
10. W. F. Hinges (Pt. 20)
11. Hinge (Stamping)
12. Cable Fasteners
13. Special Eyebolts (Drawing 3893)
14. Strainers (Admiralty)
15. Tie Rods (A.G.S.)
16. Taper Pins
17. Strainers (Binet Type)
18. Special Eyebolts (Drawing 3701)
19. Hinge Pins (Part 22)
20. Spar Joint Plates (Drawing 6396)
21. Rafwires A.G.S.
22. Washers (Duralumin, A.G.S. 157)
23. Hex. Bolts (A.G.S.)
24. Strainers (Binet Type)
25. Hex. Bolts (Metric)
26. Wiring Plates
27. Eyebolts (A.G.S. 122)
28. Feathered Bolts (A.G.S.)
29. W. F. Hinges (Pt. 21)
30. R.A.F. Turnbuckles (A.G.S.)
31. Bolt and Nuts (Metric)
32. Eyelets (A.G.S. 232)
33. Strainers (Binet Type)
35. Springs (Rubber Cord)

**I**SSUE No. 1, Vol. 3, of "Aircraft Supplies," our Fortnightly House Journal, commences a new volume, and is now ready. Copies will be sent upon application on business stationery.

## Supplies Co., Ltd.,

THE AIR BOARD.

ROOMS AND STORES,

**ACRE, LONDON, W.C.2.**

LEEDS, BELFAST AND THE LONDON DISTRICT.

Telephone:—Gerrard 276.

Telegrams:—'Upcast, Rand,' London.



Pages from Aircraft Supplies, our Fortnightly House Journal.







# "Ascol" Service

WE MAY HAVE THAT PART  
Consult our regular

**A.G.S. STANDARD HEX. BOLTS AND NUTS, EYEBOLTS AND STUDS**  
COMPLETE CHART, GIVING ALL DIMENSIONS AND DETAILS INCLUDING THE  
AGE STANDARD FOR NEW TUBES AND BOLT HEADS AND NUTS.

**STUDS** **EYEBOLTS** **A.G.S. BOLTS** **HEX. NUTS** **WASHERS** **WING FLAP HINGES** **100-100 PINS** **WASHERS** **W. F. HINGES** **HINGE (STAMPING)** **CABLE FASTENERS** **SPECIAL EYEBOLTS** **STRAINERS** **TIE RODS** **TAPER PINS** **STRAINERS (BINET TYPE)** **SPECIAL EYEBOLTS** **HINGE PINS** **SPAR JOINT PLATES** **RAFWIRES** **WASHERS** **HEX. BOLTS** **STRAINERS** **HEX. BOLTS** **WIRING PLATES** **EYEBOLTS** **FEATHERED BOLTS** **W. F. HINGES** **R.A.F. TURNBUCKLES** **BOLT AND NUTS** **EYEBOLTS** **STRAINERS** **SPRINGS**

**EXPLANATORY NOTE:** This chart is for the use of the Ascol House, Ltd., and is not to be used for other purposes. It is a complete chart of the A.G.S. Standard, and gives all dimensions and details of the parts included. It is a complete chart of the A.G.S. Standard, and gives all dimensions and details of the parts included. It is a complete chart of the A.G.S. Standard, and gives all dimensions and details of the parts included.

## "Ascol" Reference Charts !!

WE illustrate one of the New "Ascol" Charts, which we have prepared for the use of Aircraft Manufacturers. This example deals with the whole of the A.G.S. series of Bolts, Nuts, Eye Bolts and Studs and gives all dimensions and details and lengths of Threads, including the Standard adopted for Bolts, Heads, Nuts and Screw Threads and the whole of the details contained on 27 ordinary A.G.S. Blue Prints. Copies will be mailed free to Aircraft Manufacturers upon request on business stationery.

Sole Selling Agents for AVRO Patent Turnbuckles.

## The Aircraft

CONTRACTORS TO

HEAD OFFICES, SHOW-

ASCOL HOUSE, 125, LONG

REPRESENTATIVES IN BIRMINGHAM, MANCHESTER.

Managing Director—G. H. MANSFIELD.

Works:—Little James Street, W.I.



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# Can Supply It !!

THAT IS HOLDING YOU UP!  
Stock List.



1. Rafwires (A.G.S.)
2. Slotted Hex. Nuts
3. Hex. Nuts (A.G.S.)
4. Wire Ferrules
5. Splices (Admiralty)
6. Wing Flap Hinges (Drawing 4029)
7. 100-100 Pins (A.G.S. 137)
8. Washers (A.G.S. 160)
9. W. F. Hinges (Pl. 20)
10. Hinge (Stamping)
11. Cable Fasteners
12. Special Eyebolts (Drawing 3893)
13. Strainers (Admiralty)
14. Tie Rods (A.G.S.)
15. Taper Pins
16. Strainers (Binet Type)
17. Special Eyebolts (Drawing 3701)
18. Hinge Pins (Part 22)
19. Spar Joint Plates (Drawing 6596)
20. Rafwires A.G.S.
21. Washers (Duralumin, A.G.S. 157)
22. Hex. Bolts (A.G.S.)
23. Strainers (Binet Type)
24. Hex. Bolts (Metric)
25. Wiring Plates
26. Eyebolts (A.G.S. 122)
27. Feathered Bolts (A.G.S.)
28. W. F. Hinges (Pl. 21)
29. R.A.F. Turnbuckles (A.G.S.)
30. Bolt and Nuts (Metric)
31. Eyebolts (A.G.S. 232)
32. Strainers (Binet Type)
33. Springs (Rubber Cord)

ISSUE No. 1, Vol. 3, of "Aircraft Supplies," our Fortnightly House Journal, commences a new volume, and is now ready. Copies will be sent upon application on business stationery.

## Supplies Co., Ltd.,

THE AIR BOARD.

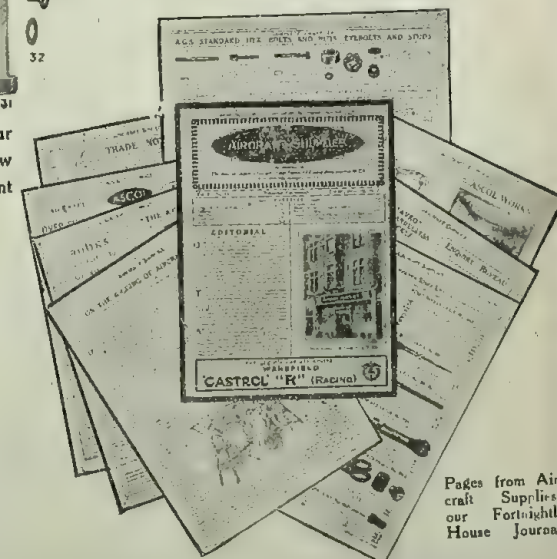
ROOMS AND STORES.

ACRE, LONDON, W.C.2.

LEEDS, BELFAST AND THE LONDON DISTRICT.

Telephone:—Gerrard 276.

Telegrams:—"Upcast, Rand," London.



Pages from Aircraft Supplies, our Fortnightly House Journal.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

# GLENDOWER AIRCRAFT CO., Ltd.,

**54, SUSSEX PLACE,  
SOUTH KENSINGTON,  
S.W.7.**



**Aircraft Manufacturers**

**CONTRACTORS TO  
:: AIR BOARD. ::**

*Telephones:*  
**Kensington 7066.  
" 7067.**

*Telegrams:*  
**"Glenacelle, Sothkens, London."**



On the same day 36 Italian aircraft made a raid on the Austrian port of Pola and dropped 6½ tons of bombs.

On the 7th the French authorities announced that during June French seaplanes had made 3,139 flights, in the course of which they attacked 10 German submarines, discovered 6 enemy mine-fields, and made 9 night bomb raids on enemy ports. During the same period French airships had made 141 trips, spending 483 hours in the air.

On the 9th a warning was received from France of the probability of the Germans using poison gas bombs on attacking London, a point worth noting.

On the 11th two more French aeroplanes bombed Frankfurt-on-Main.

On the 12th the French Aviation Service again bombed Frankfurt-on-Main, losing one machine and its crew in the process.

On the night of the 17th and 18th bombing raids on a big scale were made by the French in Western Germany and Alsace-Lorraine. 111 machines dropped 13,000 kilos of bombs.

On the 18th the New York correspondent of the "Daily Chronicle" recorded the first talk about the Liberty engine, about which much has since been heard and little seen.

On the 19th the Germans claimed that Jagdstaffel (Chaser-Squadron) No. 11, organised by Captain Baron von Richthofen, had just brought down its 200th victim after seven months' work.

On the 21st the Italian communiqué recorded that 261 Italian aeroplanes had been in action in one day during the attack by the Duke of Aosta's Army on the Bainsizza Plateau. Though this number may not be the largest actually used, it is, at any rate, the largest number recorded by any Power as being in action at one time.

A message from Paris on the 22nd recorded the dropping of incendiary bombs and attacks by machine-guns from the air on hospitals behind Verdun. This and subsequent attacks on hos-

pitals were claimed by the Germans as reprisals for attacks on hospital trains.

On the 26th Captain Laureati, on a Sia biplane with a Fiat engine, flew from Turin to Naples and back, 920 miles non-stop in 10 hrs. and 33 mins.

## SEPTEMBER.

**Naval.**—On the 21st a dispatch from Vice-Admiral Sir Rosslyn Wemyss, reporting the operations of the Navy in Mesopotamia, made special mention of the good work of No. 14 Kite Balloon Section R.N.A.S.

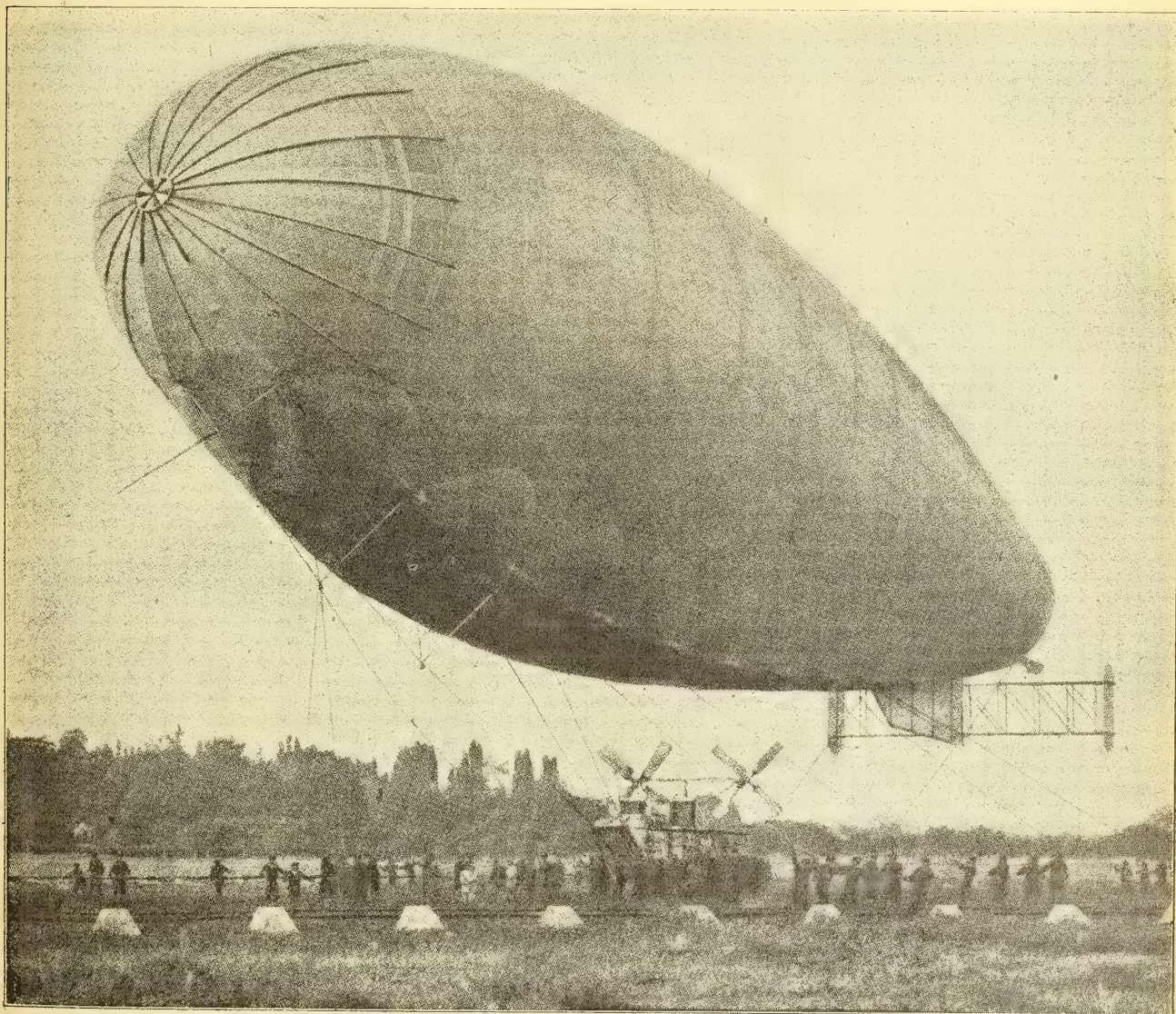
In or about the 23rd of the month, during a spell of fine weather, there was much bombing of German aerodromes in Flanders by the R.N.A.S., and it was afterwards found that certain aerodromes were made untenable owing to continuous bombing. The compliment was in due course returned against British aerodromes within their reach.

**Military.**—On the 1st Major Guy Livingston was gazetted temp. Brigadier-General.

On the 4th Brevet Lieut.-Col. J. M. Salmond was gazetted temp. Major-General while commanding the Training Establishment.

On the 15th Major T. C. R. Higgins was gazetted temp. Brigadier-General.

On the 23rd it was noted in a communiqué that Lieut. Voss, one of the most eminent German aviators, had been brought down behind the British lines. Though not officially announced, it may now be made known that he was flying a Fokker triplane and that this machine was fitted with a French-built 110 Le Rhône engine. Lieut. Voss's fight is said by those who participated in it to have been one of the greatest single-handed fights against numbers ever seen in warfare, and both the pilot



(Reproduced from an Official Italian Publication.)

An Italian Naval Airship Starting for a Patrol, one of the many Italian ships which have done good service in the war.



and his machine put up a remarkably fine performance before being shot down.

G.H.Q. Communiqué of the 26th mentioned for the first time the bringing down on the West Front of a three-seated German bombing machine, which had been attacking back areas.

The Communiqué of the 28th specifically stated that the R.F.C. as well as the R.N.A.S. were busily engaged in bombing German aerodromes in Belgium.

**Home Affairs.**—During September aeronautical affairs in England were remarkably quiet. Considerable interest was caused by the arrival in London on the 24th of Captain Doctor Laureati, who, accompanied by his Air Mechanic Michael Angelo Tonzo, flew a SIA biplane with a Fiat engine from Turin to London—a matter of about 700 miles—in 7 hrs. and 22 mins.

Also on the 24th an airship raid was made on Lincolnshire, Yorkshire, Kent, Essex, and London, but the raiders were driven off without doing any serious damage. Several minor raids, both by airships and aeroplanes, were attempted about the same period without any serious result.

**Foreign Affairs.**—On September 2nd a German communiqué recorded the 60th aerial victory of Captain Baron von Richthofen.

On the 11th Captain Guynemer, the French "ace of aces," was reported missing, and it was later ascertained that he had been shot down and killed in Flanders.

In view of labour disputes of a later date in England, it is of interest to note that on the 29th reference was made to wages disputes in French aircraft factories. Such troubles have been comparatively of minor importance in France, because, owing to the excellent system of Government, any man who neglects to do his duty in a munition factory is promptly presented with the alternative of meeting German competition in the trenches.

On Sept. 29th Serjt. Stoppani, of the Italian Army, made a record flight on an S.V.A. biplane to Rome, 375 miles, in 2 hrs. 50 mins. (137½ m.p.h.).

#### OCTOBER.

**Naval.**—During October the R.N.A.S. continued to bomb German aerodromes in Flanders with good effect, suffering in the course of these actions a very low percentage of casualties.

On the night of the 24th-25th a G.H.Q. Communiqué recorded the bombing of Burbach and Saarbruck by R.N.A.S. aeroplanes. Six tons of bombs in all were dropped and owing to bad weather on the return journey three machines were lost. Some attempt was made by the Press to hail these raids as reprisals on Germany, the papers omitting to note that the raided districts were in Lorraine. Thereafter, a number of other raids were made by the R.N.A.S. in these districts, which districts supply a large quantity of iron for German munitions.

**Military.**—On October 3rd R.F.C. bombing machines dropped 8 tons of bombs round Courtrai, Cambrai and on dumps near Roulers and Douai, and from then to the 8th a large amount of bombing was done in support of the British attacks on that part of the German line.

A dispatch published on Oct. 31st from Sir Charles Munro, commanding in India and covering operations in the Indian

Empire from March 10th, 1916, to March 31st, 1917, made special mention of the good work of the R.F.C. against Mohmand tribes on the north-west frontier.

**Home Affairs.**—On the 12th a War Office communiqué was published stating that General Henderson had been "deputed to undertake special work" and "had been lent for such Service." It is now understood that the service in question was the paper organisation of the new Air Force, the Bill for which was introduced into Parliament the following month.

The same communiqué recorded that Major-General J. M. Salmond was appointed Director-General of Military Aeronautics in place of General Henderson, and that Major-General Brancker, hitherto Deputy-Director General of Military Aeronautics, was appointed to a command abroad, and that his post would not be filled for the time being.

General Salmond's appointment was ultimately gazetted on October 29th.

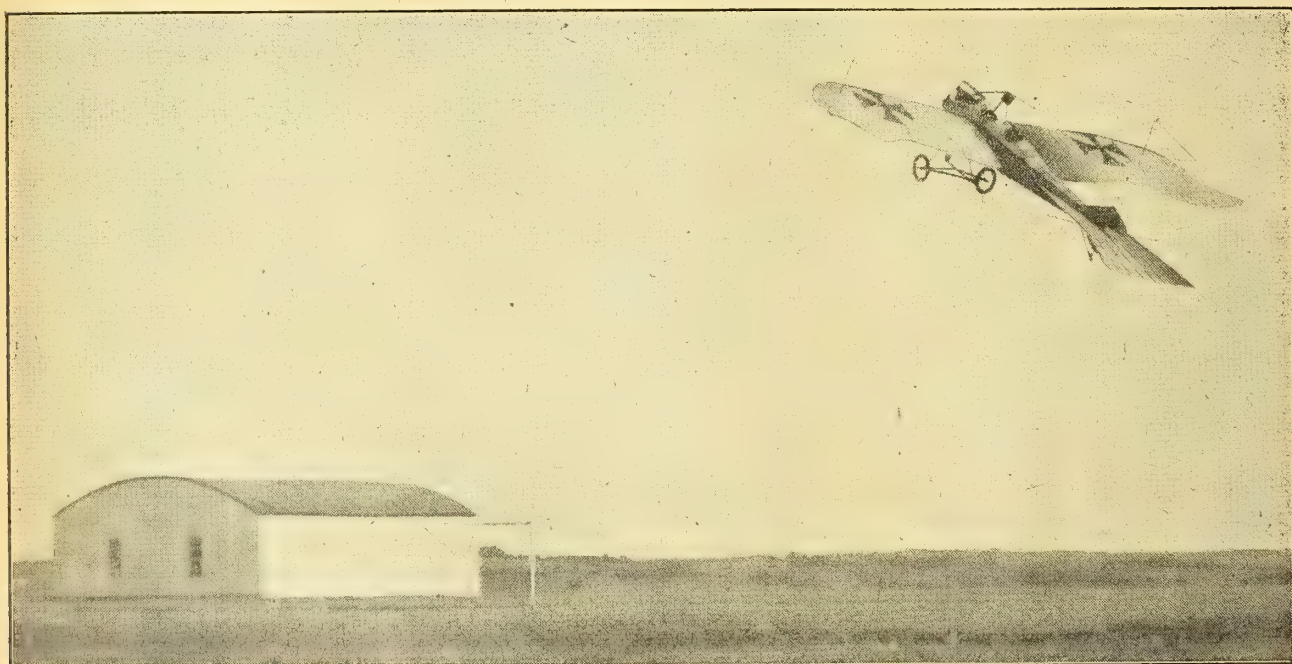
About the same date it was officially disclosed that Major-General Ashmore, formerly commanding an R.F.C. Brigade and later an artillery Brigade, had been placed in command of the London Air Defences, and it is noteworthy that great improvements in this Department took place within a very short time of his appointment.

On Oct. 16th Mr. Bonar Law announced in the House of Commons that an Air Ministry would be formed.

On the night of 19th-20th, Friday, a raid was made on England by a number of Zeppelins, variously estimated to be between 8 and 11 in number. These ships were driven up to 20,000 ft. by the coastal Anti-Aircraft Defences, and mostly dropped their bombs without doing any damage. Owing to the masterly inactivity of the London Air Defences a number of these ships which were in the vicinity of London were unable to find the City, and only one of them, which drifted across London with her engines shut off, managed to penetrate the London area. Owing to operations on this side of the water the airships were unable to discover their precise whereabouts, and in endeavouring to return to Germany were drifted far to the south of their proper course, with the result that four of them descended in France through running short of petrol. It is also probable that a fifth, from which the crew landed, drifted out into the Mediterranean and was lost. The Germans claim to have dropped 26 tons of bombs in England in this raid, but quite as much damage might have been done by 26 lbs.

The result of the clever handling of the London Air Defences was that violent attacks appeared in the Press and in the House of Commons on the 23rd, it being assumed by the ill-informed that the Defence Forces were neglecting their duties. Ultimately the critics were instructed as to their ignorance.

On the 29th Lord Curzon in the House of Lords moved a vote of thanks to the Navy and Army, and made special reference to the work of the Flying Services. It is of interest to note that in his speech he mentioned that at the beginning of the war there were 800 men in the R.N.A.S., and that at the time of his speech there were 42,000.



ASKING FOR TROUBLE.—A German Pilot "Zooming" inordinately on an old type Taube.



Telephone:—

OFFICE ... 912 REGENT.  
WORKS ... 4762 KENSINGTON.  
281-2-3 WEMBLEY.

Telegrams:—

"SOCIABLE, PHONE,  
LONDON."

# HOOPER & CO. LTD.

**AEROPLANE BUILDERS  
TO H.M. AIR COUNCIL.**

**MOTOR-BODY BUILDERS**

TO



BY ROYAL WARRANT.



BY ROYAL WARRANT.



BY ROYAL WARRANT.

HIS MAJESTY THE KING.

HER MAJESTY THE QUEEN.

HER MAJESTY QUEEN ALEXANDRA.

H.I.M. MARIE DOWAGER EMPRESS OF RUSSIA.

H.R.H. THE DUKE OF CONNAUGHT.

**HOOPER & CO. are also Coachbuilders to**

H.M. The King of Spain.

H.M. The King of Norway.

H.M. The Queen Mother of the Netherlands.

H.R.H. The Princess Royal.

H.R.H. Princess Louise, Duchess of Argyll.

H.R.H. Princess Victoria.

**54, St. James's Street,  
PICCADILLY, LONDON, S.W.1.**

S.C.G.

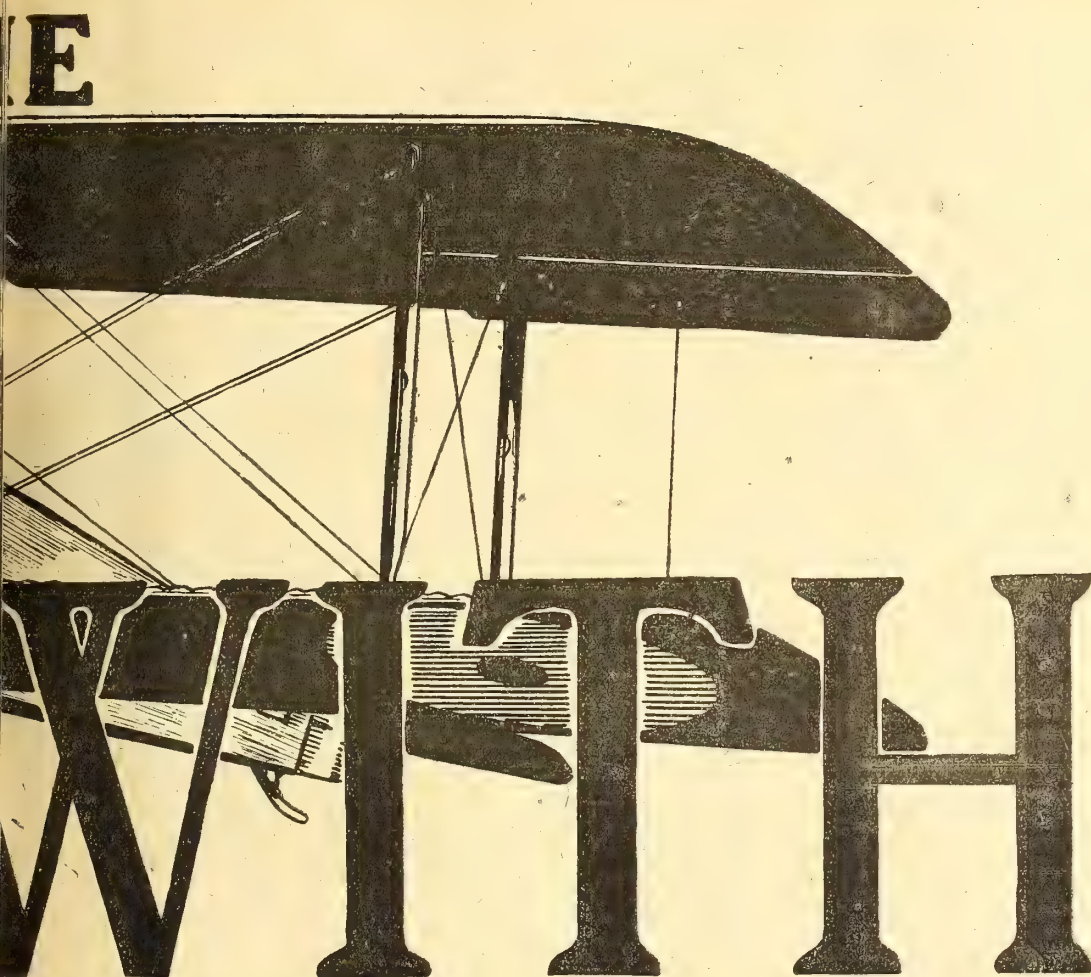
T



AVIATION COM  
KINGSTON-ON-TH  
: : CONTRACTORS TO

Telephone : KINGSTON 1988 (8 lines).  
Telegrams : SOPWITH, KINGSTON.





**PANY, LIMITED**

**AMES, ENGLAND.**

**H.M. GOVERNMENT. :**



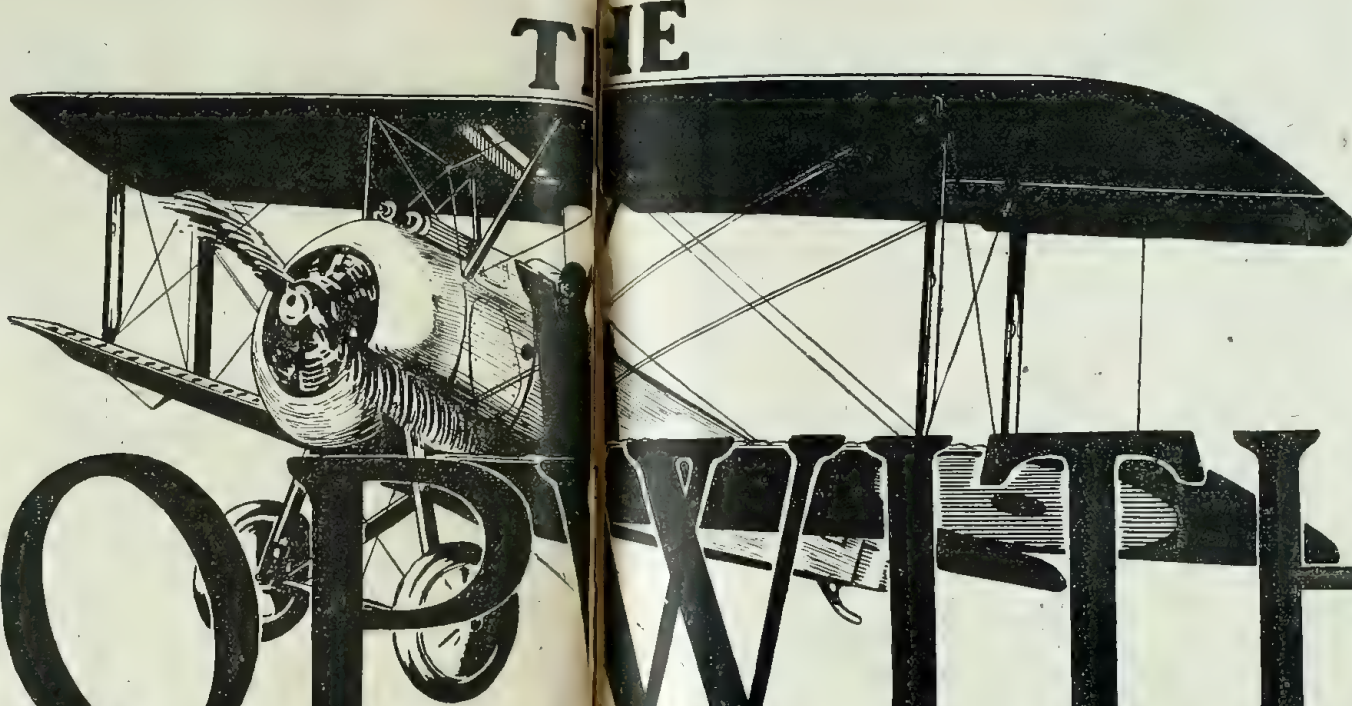
Paris Office:  
21, RUE DU MONT THABOR.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





S.C.G.



# THE SOPWITH

AVIATION COMPANY, LIMITED  
 KINGSTON-ON-THAMES, ENGLAND.  
 : : CONTRACTORS TO

Telephone : KINGSTON 1988 (8 lines).  
 Telegrams: SOPWITH, KINGSTON.



Paris Office:  
 21, RUE DU MONT THABOR.

# B. A. S.

The letters B.A.S. mean Blackburn Aircraft Standard and refer to the well-known Metal Fittings produced by the Blackburn Aeroplane and Motor Co., Ltd. These letters have become synonymous with the highest quality, accuracy and reliability.

# *Blackburn*

## AIRCRAFT

Made by PIONEERS in  
the construction of Land  
Machines and Seaplanes.

The BLACKBURN  
AEROPLANE and  
MOTOR CO., Ltd.,  
"Olympia,"  
LEEDS.

## "Always at the Front!"

*Steele's Ad. Serv.*

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



**Foreign Affairs.**—On Oct. 2nd the "Morning Post" said that the German aviator, Voss, whose death had already been mentioned, had been killed in a triplane. This was the first mention of triplanes in the German Service.

On the 3rd it was noted that some 40,000 German aircraft workers had returned to work after a strike. It will thus be noted that the workpeople of Coventry cannot even claim originality for their traitorous action.

On the 5th the "Morning Post's" Correspondent at the Front referred to German aviators being brought down by rifle and machine-gun fire. This was the first indication that the Germans had adopted to any considerable extent the British operation of using aeroplanes against infantry.

On the 10th this paper published an official statement issued by the U.S. Government on Aug. 12th, concerning the extraordinary genesis of the much-talked-of Liberty engine. It is interesting to note that by the end of the year several of these engines succeeded in revolving, and it was even said that some of them had succeeded in enabling aeroplanes to fly.

It was also noted that Dr. Lorenzo Santoni had been elected the first President of the Aero Section of the Scientific and Technical Committee of the Society for Promoting Italian Industries.

On the night of 2nd-3rd the French Air Service made big attacks on Western Germany, Frankfurt and Dortmund being bombed as well as a number of munition centres in Lorraine.

A message from Paris on the 6th stated that in August French Naval airships made 84 flights and French Naval aeroplanes 3,087.

On Oct. 1st Mr. W. G. Shephard, the Representative of the United Press of America in Stockholm, stated in the "Daily Express" that the Germans were building Gotha bombers with four engines of 260 h.p. each. This was the first mention in this country of the "Riesenflugzeug," of which it is now understood a large number are in course of manufacture for the special benefit of London.

A Turkish communiqué of October 1st claimed that 4 British aeroplanes had been brought down in the Euphrates area.

A message from Mr. Warner Allen, the well-known war correspondent, dated Oct. 5th, quoted a captured document from Field-Marshal von Hindenburg, advising the saving of German fighting pilots and machines as much as possible so as to have them ready for a big effort when needed.

On Oct. 10th there was published a quotation from the "Aerial Age," New York, recommending that big bombing machines built in America should be flown across the Atlantic to save transport by ship. This scheme apparently has the support of Italian aviators in America, and appears to be a reasonable proposition if properly organised.

On the 17th an official statement of the United States Secretary of State for War was quoted, in which he said that £128,000,000 provided by Congress for

aviation in July was to cover all types of machines and engines, for training as well as active service. The statement also said that 24 flying schools were in operation in the United States and that many aviators were already in training in Allied countries.

On the 31st it was mentioned that Major Lombard on an S.V.A. biplane had covered 1,400 kilometres (about 850 miles) in 6 hrs. 45 mins., a journey which must be pretty well a world's record.

On the 22nd Lieut. Resnati on a Caproni machine flew from Newport News to Minnola, U.S.A., with eight people on board, covering 300 miles in 4 hrs. 15 mins.

## NOVEMBER.

**Naval.**—An official view of the work of the R.N.A.S. published on Nov. 17th claimed recent raids on Saarbruck and the other iron districts of Lorraine as reprisals. An Admiralty communiqué issued on the 22nd made it known officially that the R.N.A.S. machine which bombed Constantinople was a Handley Page. Unofficially this had been known for some considerable time. As usual the R.N.A.S. continued its work in Belgium and in other war areas.

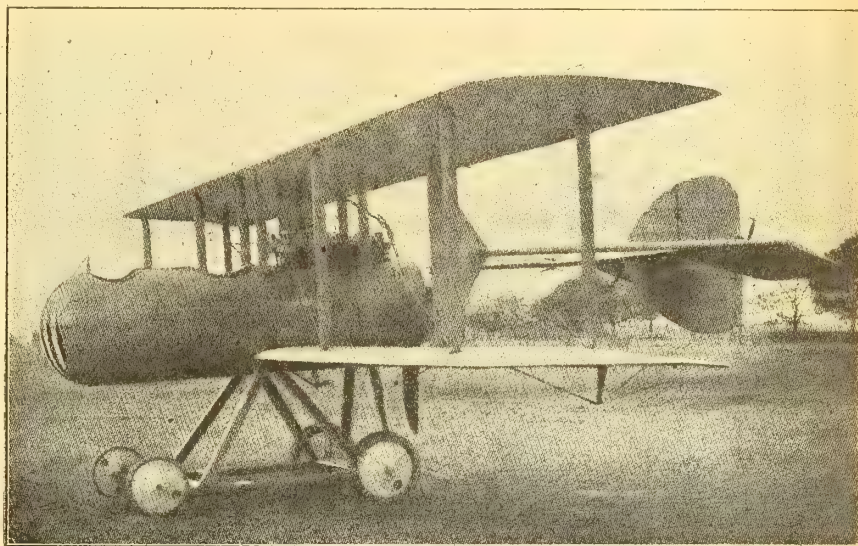
**Military.**—On the 22nd Major-General Salmond was gazetted a Member of the Army Council, the appointment to date from Oct. 18th.

On Nov. 10th Brigadier-General C. A. H. Longcroft was gazetted temp. Major-General.

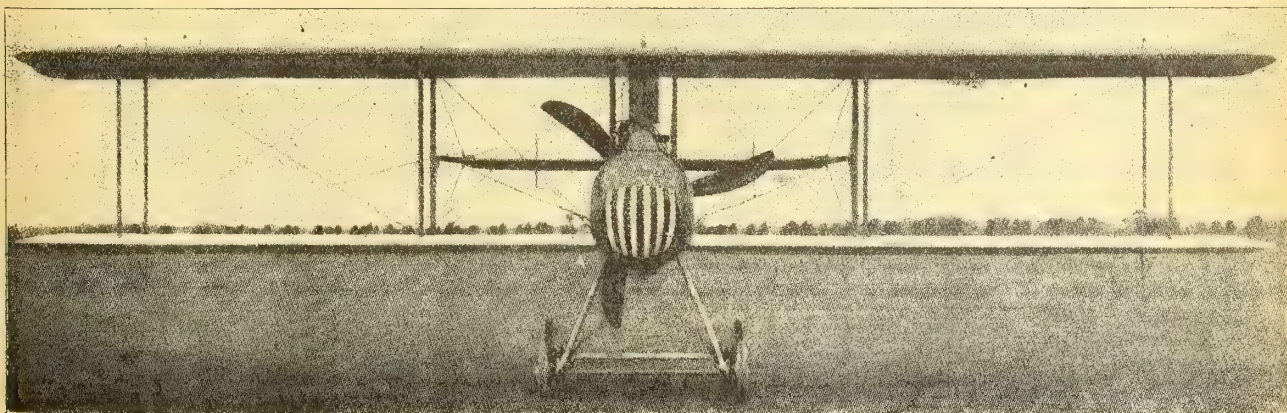
On the 12th Brevet-Major E. R. Ludlow Hewitt was gazetted temp. Brigadier-General.

G.H.Q. Communiqués referring to the fighting of Nov. 5th and 6th at Passchendaele made special reference to the good work done by low-flying aeroplanes of the R.F.C. and contemporary dispatches showed that the Coys had distinct mastery over the Germans during that period, despite heavy losses.

War Office Communiqués of 8th, 9th, 10th, and 11th referred to the consistent bombing by the R.F.C. of the Turkish Army during the renewed offensive in Palestine.



Side View of the "Continental" Pusher Biplane.



(Reproduced from "Aerial Age"—Passed by U.S. Censor.)

**PART OF AMERICA'S AIR FLEET.**—The "Continental" Pusher, which is credited with a speed of 95 miles an hour.



On the 17th Major J. G. Hearson was gazetted temp. Brigadier-General.

G.H.Q. Communiqués referring to the fighting of the 21st, 22nd, and 23rd, and thence to the beginning of December, referred specially to the value of the R.F.C. work in the fighting before Cambrai, that of the 22nd containing special reference to the Australian pilots of the R.F.C.

On the 24th Brigadier-General Ludlow-Hewitt was gazetted Inspector of Training, Home Training Division.

**Home Affairs.**—On the night of Oct. 31st-Nov. 1st about 30 German aeroplanes attacked London, the first crossing the coast about 10.45 p.m. Of these only three or four got inside the London area, and as a result of the raid 8 people were killed and 21 injured. The result seemed a vindication of the London Air Defences against recent criticism.

On November 8th the Air Force Bill was introduced in the House of Commons and passed its first reading. The second reading and Committee stage were passed on the 12th and the report stage and third reading on Nov. 13th.

The Earl of Crawford moved the second reading of the Bill on the 21st, and it passed Committee stage and third reading stage in the House of Lords on the 27th, receiving Royal Consent on the 28th.

Prior to its passing the House of Lords, Lord Rothermere was appointed, on the 26th, President of the Air Council to be.

Before the Bill had even passed the House of Commons Mr. Lloyd George had apparently offered the post of Air Minister to Lord Northcliffe privately. Lord Northcliffe refused the post in a letter which was published in various papers on the 15th, and as a result Lord Cowdray, President of the Air Board, to whom the news of the offer to Lord Northcliffe was conveyed for the first time in Lord Northcliffe's letter of refusal, promptly resigned his position in a dignified letter of protest which was also published in the Press.

On the 8th the King and Queen visited the Bristol works and were enthusiastically received. This enthusiasm, however, did not prevent the workers going on strike in December.

On the 19th the case which was commonly known as the Curtiss Corruption Charge was settled by permitting those charged to return the money received, as already mentioned.

The first aeronautical lecture of the 1917-18 season was delivered on the 14th to the Aeronautical Society of Great Britain by Captain Green (T.F.), who discoursed on "The Technical History of the Aeroplane."

On the 23rd the King visited the National Physical Laboratory and on the 26th he visited the works of Gwynne's Ltd. and Napier's Ltd.

On the 26th Mr. G. H. Roberts, Minister for Labour, visited various cotton factories in Lancashire with a view to using cotton mills for aircraft work.

On the 24th the King visited the R.F.C. Hospital at Eaton Square.

On the 28th an official statement was issued concerning the strike of some 40,000 and 50,000 aircraft workers in Coventry. The strike lasted for a week or more, and had very serious results in decreasing the output of aircraft.

Also on the 28th an interesting lecture was delivered to the Royal Society of Arts by Lieut.-Colonel Mervyn O'Gorman, his subject being "Aerial Transport and Travel." The views expressed in the course of this lecture are worthy of particular attention as an antidote to over-enthusiasm as to the prospects of aviation after the war.

**Foreign Affairs.**—An Italian communiqué of Nov. 1st referring to the Italian defeats on the Isonzo said: "The untiring aviators are worth being mentioned to the admiration and gratitude of the country." This was a recognition of the splendid work of the Italian Flying Corps during the retreat of the Italian Army to the Venetian Plains. Prior to this defeat the Italian Army had been deluged with leaflets from Austrian aeroplanes, calculated to cause ill-feeling between Italian troops and the British and French.

The Paris "Auto" published a warning by Signor Caproni concerning the Germans' big plans for the spring of 1918.

In the "Matin" of Nov. 18th M. Lasies advocated strongly the building of "aerial tanks," such as those which the Germans had already been using, made entirely of metal to render them bullet-proof. The function of these machines is to fly low over troops on the ground, and to be thus immune against attack. M. Lasies added that he hoped soon to see the French Aviation Service properly equipped—a reference which clearly indicated that things were not as they should be with French aviation.

On the 19th it was noted that the production of aeroplanes in France had now been placed under the Ministry of Armaments and War Manufactures. Military and Naval aeronautics were placed in the hands of a special Under Secretary belonging to the Ministry of War. This marked the beginning of the reform of the French Aviation Service after a very bad period.

A German communiqué of the 21st mentioned that German aeroplanes were used against British warships during an attempted British advance in the "German Bight" on Nov. 17th.

## DECEMBER.

**Naval.**—On the 16th the Admiralty announced that an airship, with a crew of five, was destroyed in the North Sea by hostile aeroplanes, and that another airship was forced by circumstances to land in Holland on the 12th.

**Military.**—On the 3rd Brig.-General E. L. Ellington was gazetted Deputy-Director-General of Military Aeronautics.

On the 7th Temp. Maj.-General J. M. Salmond was promoted to Lt.-Colonel.

A dispatch from Mr. Ward Price, the well-known War Correspondent, on Dec. 2nd, reported the success of the R.F.C. in their first meeting with German aeroplanes on the Italian Front.

On Dec. 17th and 18th the R.F.C. in France scored heavily over the Germans, and finished the year in a very healthy state of self-satisfaction.

A communiqué from Palestine on Dec. 16th announced the bombing by R.F.C. machines of motor-boats and their sheds at the mouth of the Jordan. It is noteworthy that on this occasion the objectives of the machines were some 700 ft. below the level of the adjacent Mediterranean.

To finish the year, Major-General Trenchard, G.O.C., R.F.C., in the Field, was promoted to a Military K.C.B., and the seal was thus set on an admirable year's work by the Corps.

**Home Affairs.**—On the 3rd, in replying to Mr. Pemberton-Billing, Mr. Bonar Law said that the Civil Aerial Transport Committee had not yet reported. It had held two meetings, and it had appointed five sub-committees, and the cost so far had been at the rate of £600 per annum.

On the 5th it was recorded that the Secretary of the War Office had announced that Military funerals were permissible to civilian victims of air raids when troops were available for the purpose.

It was announced on the 5th that the property of the National Physical Laboratory was now vested in the Imperial Trust for the Encouragement of Scientific and Industrial Research, and that the scientific control of the N.P.L. would be in the hands of the President and Council of the Royal Society.

On the 4th the King and Queen visited the Integral Propeller Company and the works of the Grahame-White Aviation Company at Hendon.

On the 7th an imitation Zeppelin, of British construction, journeyed over London.

On the 8th a Blimp and two flights of aeroplanes dropped handbills over London as an incitement to the populace to buy War Loan from the Tank Bank in Trafalgar Square.

On the 6th there was an early morning raid by enemy aeroplanes, in which seven groups of machines—about 30 in all—took part. Only two or three got through the Defences, and two machines were brought down—six Germans being captured. As a result of the raid there were 7 killed and 23 injured.

On the 14th Lord Rothermere, speaking at a dinner at Gray's Inn, made his first public announcements as President of the Air Council. There was nothing particular to report.

On the 19th it was announced that the Minister of Munitions (Mr. Winston Churchill) had appointed Sir Wm. Weir to be Director-General of Aircraft Production.

On the 13th 1,200 aircraft workers at Bristol went out on strike and returned to work on the 17th.

On the 19th another raid on London took place, doing but little damage. One of the raiders was shot down, and two of the crew were captured.

Considerable excitement was caused on the 24th by wholesale changes on the Technical and Production sides of the Air Board. Mr. Henry Fowler, C.B.E., was appointed Assistant Director-General of Production. Lieut.-Col. W. Alexander was made Controller of the Supply Department, and Lieut. Col. J. G. Weir, a younger brother of Sir William Weir, was made Controller of the Technical Department.

**Foreign Affairs.**—On the 5th it was announced that Lord Montagu had arrived in Canada to enthruse the populace for aviation.

On the 8th the French Financial Authorities opened a War Loan bank installed in the car of a captured Zeppelin—thus going one better than the English Tank bank.

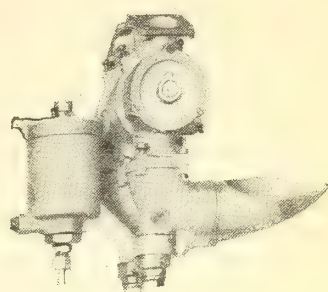
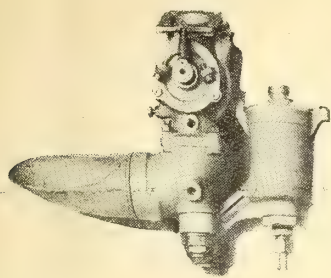
On the 5th the "Matin" announced that a French airship had crossed the Mediterranean to Algiers in 11 hours.

On the 8th 150 Italian aeroplanes bombed the Austrians on the Asiago Front, and airships also assisted. This demonstrated that whatever may have been the state of the Italian Army, the moral of the Italian Air Service was as high as ever.

On the 11th the "Petit Parisien" reported an interview with M. d'Aubigny, Deputy-President of the Inter-Ministerial Civil Aeronautic Committee, in which he advocated the immediate establishment of a postal line between London and Paris. He said that the agreement had already been settled in principle, and it only remained to put the idea into practice.

On the 17th Lieut. Brach-Papa on a Sia biplane, with a passenger, reached a height of 7,075 metres (23,220 ft.), which appears to be a world's record for passenger flight.





**LONDON = CONSTANTINOPLE  
FLIGHT**

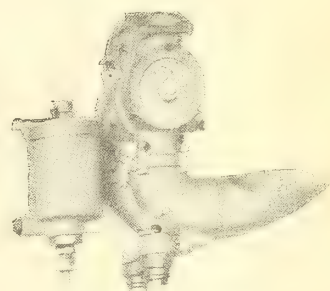
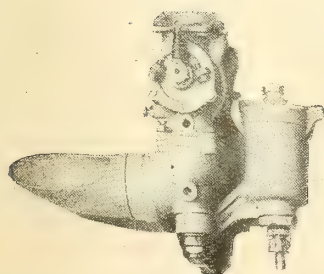
# **CLAUDEL HOBSON CARBURETTORS**

— were fitted to the —

**ROLLS-ROYCE  
ENGINES IN THE  
HANDLEY-PAGE**

aeroplane that carried out this  
noteworthy performance

**H.M. HOBSON LTD**  
29, VAUXHALL BRIDGE RD., LONDON, S.W.1.



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

# Aeroplane and Seaplane Designers and Builders



# SHORT

TELEPHONE . . .  
TELEGRAPHIC ADDRESS -



# BROTHERS



CONTRACTORS TO THE ADMIRALTY.

LONDON OFFICE:

**"WHITEHALL HOUSE,"**

**29-30 CHARING CROSS, S.W.1.**

REGENT 378

"TESTED, PHONE, LONDON."





# Aeroplane and Seaplane Designers and Builders



# SHORT

TELEPHONE . . .  
TELEGRAPHIC ADDRESS . . .

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

# BROTHERS



CONTRACTORS TO THE ADMIRALTY.

LONDON OFFICE:

"WHITEHALL HOUSE,"

29-30 CHARING CROSS, S.W.1.

REGENT 378

"TESTED, PHONE, LONDON."

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



Wm.  
**COLE & SONS,**  
LTD.,

*Aircraft Manufacturers.*

**Contractors to  
H.M. Government.**

WORKS:  
235, HAMMERSMITH RD.,  
LONDON, W.6.

Telephone: HAMMERSMITH 1413.



## THE ROYAL FLYING CORPS.

BY C. G. GREY.

When one comes to write of the work of the R.F.C. in 1917, one finds oneself up against two fundamental difficulties—apart from the Defence of the Realm Act, commonly known as Dora—firstly the poverty of the English language, despite the fact that it has stolen most of the expressive adjectives of all other languages, and secondly the unconquerable modesty of the Corps itself. Both difficulties prevent one from saying what one would like to say about the R.F.C. as a whole and about the individuals who are responsible for its present high moral and efficiency.

None can accuse this paper or its editor of being unduly optimistic in aeronautical matters concerning the Flying Services, and the history of these Services in the past has proved that lack of optimism has been justified. To-day, therefore, one feels all the more satisfaction in being able to say that there is so little the matter with the R.F.C. that only a search for almost inhuman perfection could find cause for complaint.

So long as the human animal remains what it is, some individuals must remain imperfect, and those in their immediate sphere of influence must have grievances against them. Therefore one can, of course, find people in the Corps with more or less justifiable cause of complaint, all the way from the 2nd A/M. who has been bitten by his serjeant for coming on parade in the morning with dirty boots after having spent the night holding down a machine in a winter gale, to the squadron commander who might have been a brigadier-general if only he had had the knack of commanding men as well as he can fly, or can judge the work of his squadron mechanics.

### A SLIGHT RETROSPECT.

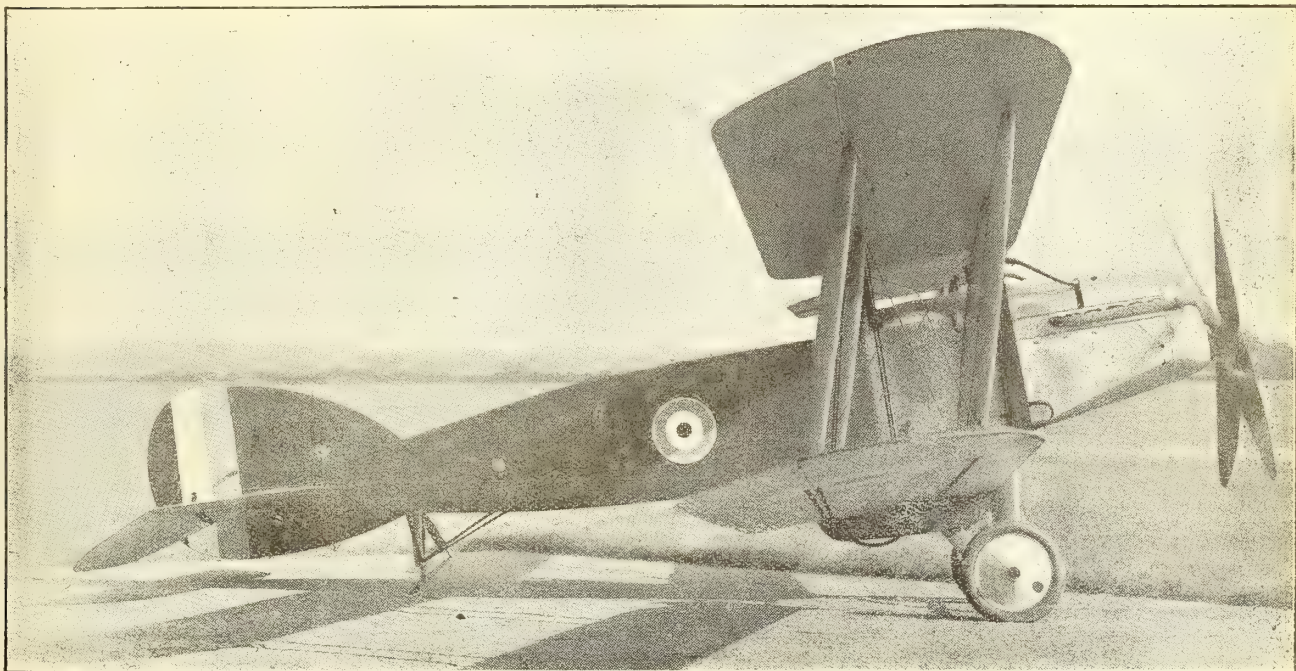
After all, it is the pilots themselves—and their observers—who are the best, if the unconscious, judges of the rest of the Corps. At any rate, one can judge from them and their average attitude of mind whether the state of the Corps in general is as it should be or not. And to anyone who is closely in touch with the pilots

and observers the difference between their mental attitude to-day and their attitude at the same period in 1917 and 1916 is absolutely startling.

At the beginning of 1916, thanks to imbecile mismanagement of aeroplane and engine output at home, the aviators were thoroughly depressed. They knew that their machines were outclassed by the German Fokker single-seaters. Even though the Fokkers were purely defensive machines and never came over our side of the lines our aviators found no consolation in the fact, for their duties lay, in the nature of things, on the German side of the lines. Though politicians, in and out of uniform, scoffed at the "Fokker scourge," that scourge was a very real thing to the men who had to meet it. The highest witness to the strength of character of the senior officers commanding the R.F.C. in the Field is the fact that they maintained the moral of the Corps in spite of this depression.

### AN APOLOGIA.

By the Spring of 1916, thanks very largely to agitation in the Press and in Parliament, matters had improved appreciably. It was entirely lamentable that such agitation should have been necessary, and one's personal sympathy is very much with those officers who hold it an impertinence that mere journalists and politicians should interfere with the affairs of the Army. The soldier of the Old Army would rather have died because of inadequate equipment than have had his equipment improved by means of such agitation, and one respects such an heroic and loyal outlook. At the same time, history recalls that but for very similar agitations our troops in the Crimea would have died in tens of thousands because of brown-paper boots and absence of medical stores and hospital equipment. Therefore one pleads that the agitators of 1916 at least justified their unpleasing existence, even if their agitations had only hastened the better equipment of the Corps by a few weeks instead of months.



A BRITISH FIGHTING MACHINE.—The Bristol Two-Seater Fighter, with Rolls-Royce Engine, one of the most successful machines of 1917.



In any case, whether *propter hoc* or merely *post hoc*, by the time the Army was ready for the Somme battles in July of 1916 and afterwards, the R.F.C. had definitely established a mastery in the air which, as is clearly shown by captured documents duly published in the British newspapers, produced a state of depression on the German side of the lines—among infantry, gunners, and aviators alike—very much greater than any which has ever existed in the British Army.

After their defeat on the Somme the German authorities naturally made the greatest efforts to pull their Air Service together, and, under General von Höppner, great improvements were made, which resulted in the pendulum of superiority swinging back somewhat to their side early in 1917. It was at that period that the Under-Secretary for War, Mr. MacPherson, certainly the most honest and most straightforward official who has spoken for any Government department in recent years, admitted that the German Air Service, rested and reinforced during the Winter, was putting up a formidable opposition to the R.F.C.

#### THE MEN AT HOME.

In the meantime, however, not less strenuous efforts were being made in this country. The new Air Board, with Lord Cowdray and Sir William Weir as its moving spirits, was doing its utmost to repair the mistakes of the past and to overtake the demands of the R.F.C. in the Field for more and better aeroplanes. Theirs was a colossal task. They were up against a clumsy and intricate system which wasted quantities of valuable time, as between the demands from the front and the ultimate execution of those demands. They were placed in the midst of a noisome hot-bed of intrigue, where officials and officers in subordinate departments were playing for their own hands, and deliberately holding up progress to show their authority or to try and increase the importance of their office. And they were hampered on all sides by personal jealousies and individual incompetence.

Despite all this, they made quite astonishing headway, and by sheer business acumen and strength of character cut through obstacles in which lesser men would have been hopelessly tangled. In consequence of their efforts the production of aircraft increased to an extent which at any rate resulted in the R.F.C. in the Field being thoroughly well equipped by the time Lord Cowdray resigned his office as President of the Air Board and Lord Rothermere took office as Air Minister, and President of the Air Council created by the Air Force Act at the end of November.

#### A MATTER OF GRATITUDE.

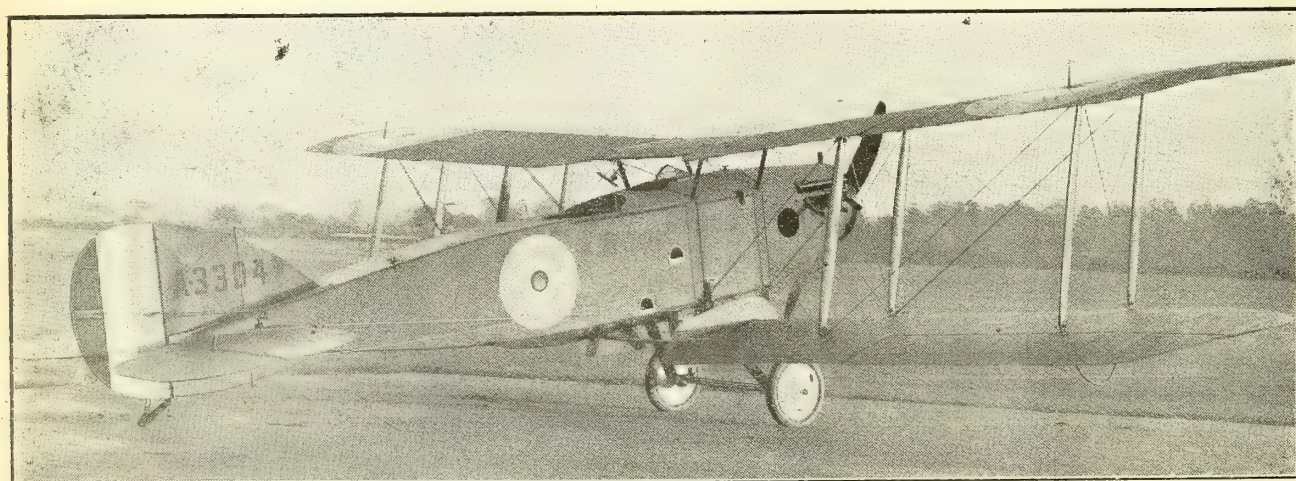
This is not the place to discuss the sudden and drastic changes made by Lord Rothermere in the Technical Department, but one must in common justice say that, considering the difficulties under which the Technical Department has had to work in the past, unable because of the System officially to communicate direct either with the R.F.C. in the Field or with aircraft constructors at home, and thus hampered by second-hand communications, with all its attendant delays and errors of transmission, the R.F.C. does owe a debt of gratitude to many individuals in the Technical Department, who have been directly or indirectly responsible for the adoption of the machines and other matériel which have enabled it to attain its present high state of effectiveness.

Such gratitude is particularly due to many R.F.C. officers who, despite their longing to get back to the clean open-air life of active service, and away from the stuffiness, the deadly monotony, the long hours, and the intrigues of office life, have none the less stuck it out and have done their duty by those in the Field, on inadequate pay and without promotion for a full year. Which remark applies chiefly to those officers serving in technical positions under the Air Board, though it also applies to some extent to those in administrative offices and in training establishments.

#### THE R.F.C. IN THE FIELD.

One has often heard people in office jobs say that they wished they were back again on active service. Also, one has heard people home on leave say that they were bored stiff with England and its restrictions and rules and regulations and limitations, and wished they were back in France, or Egypt, or even Mesopotamia. "Punch," that inimitable barometer of the atmosphere of the British Nation and all that pertains thereto, gave us only a few weeks ago a perfect sketch of the feelings of an officer home on leave and his joy on rejoining his unit in France. There are those who have doubted the genuineness of these protestations of affection for active-service life, and have put them down for what is colloquially called "swank." Those whose privilege it is to know rather more of the inside of things know that, whatever may be a man's regrets at leaving those dear to him at home, he personally is vastly happier on active service than in any job in England.

Of no branch of the King's Forces is this more true than of the Royal Flying Corps as it is to-day. For months past those of us who have been in close touch with the people who do the flying have felt the entire change of atmosphere, as compared with black days of



A Three-Quarter view of a Bristol Fighter, with engine and cowl ing somewhat different from that in the preceding illustration



THE BRITISH & COLONIAL  
AEROPLANE CO., LIMITED

———— FILTO , BRISTOL ————

CONSTRUCTORS OF

*The "Bristol" Aeroplanes.*

—— CONTRACTORS TO ——  
H.M. AIR FORCES.

Telegrams :  
"AVIATION, BRISTOL"



Telephones :  
3906 BRISTOL  
(Private Branch Exchange)

# WESTLAND *Aircraft.*

WESTLAND AIRCRAFT WORKS.

BRANCH OF PETTERS LIMTD.,

YEOVIL.

*Phone, Yeovil 141. Telegram Aircraft Yeovil.*



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# WESTLAND AIRCRAFT WORKS

---

were neither Converted, nor Adapted, but were Created solely for the Production of Aircraft. Prior to August, 1915, our Site was a Peaceful Pasture, to-day it is covered with Buildings in which we construct Aircraft for Land and Sea. Within the Works Enclosure we have laid out a first-class Aerodrome, and our Land Machines are actually delivered by Air direct from the Works to the Battle Area.

This Establishment has been brought into being, manned and equipped without in any way interfering with the organisation, capacity, or production of the old established Engine Works of Petters Limited.

We cannot execute Private Orders for Aircraft at present, but we desire to keep our name before prospective buyers, and we feel sure that the official Reputation which we enjoy with the Air Forces for the production of War Machines will recommend us for some portion of the Commercial Business which will be in the Market at the conclusion of the Great War, and also for a continuance of Official Orders.

---

## Branch of PETTERS Ltd., YEOVIL.

Telegrams: "AIRCRAFT, YEOVIL."

Telephone: YEOVIL 129

# ROLLS-ROYCE

Contractors to H.M. Government.

ROLLS-ROYCE AERO ENGINES  
LIKE  
ROLLS-ROYCE CARS  
ARE  
THE BEST IN THE WORLD.

## The World's Records are held by Rolls-Royce Aero Engines.

**CLIMBING.** An aeroplane fitted with **Rolls-Royce** engine holds the **World's Record for Rapid Climbing.**

**SPEED.** An aeroplane fitted with **Rolls-Royce** engine holds the **World's Record for Speed** in the air.

**RELIABILITY.** An aeroplane (Handley Page) fitted with **Rolls-Royce** engines holds the **World's Record for Long Distance Flight** under war conditions, viz.: London to Constantinople.

**WEIGHT CARRYING.** An aeroplane (Handley Page) fitted with **Rolls-Royce** engines holds the **World's Record for Weight Carrying**, viz.: London to Constantinople—total weight **Six Tons.**

**PASSENGER CARRYING.** An aeroplane (Handley Page) fitted with **Rolls-Royce** engines holds the **World's Record for carrying 21 Persons** to a height of over 7,000 feet.

**ROLLS-ROYCE, Limited, 14 & 15, Conduit St., London, W.1.**

Telegrams: Rolhead Reg., London.

Telephone: 1654 Gerrard (3 lines).

AND AT

PARIS. NEW YORK. PETROGRAD. MADRID and BOMBAY.



the winter of 1915-6, and the somewhat gray days of 1916-17. During the big battles round about Easter of 1917, although R.F.C. casualties were heavy, one heard hardly any grumbling about bad supplies or bad quality of machines, and from that time forward the improvement in the whole spirit of the Corps has been more and more marked.

At no time did the Corps lose faith in its commanding officers. The General Officer Commanding-in-Chief the R.F.C. in France has always held not only the confidence of his pilots and observers, but their personal affection, and his Brigade-Commanders likewise have been trusted implicitly and obeyed loyally by those under them. So much one was able to say truthfully a year ago, when writing a review of the year corresponding to this. But to-day not only is this confidence in their leaders more firmly established than ever, but one finds that the aviators have greatly increased confidence in themselves.

#### REASONS FOR CONFIDENCE.

In former years they did their duty loyally and died gallantly, feeling that it was the 'only thing to do, in spite of the superiority in numbers and equipment of the enemy. To-day, to put it expressively, if inelegantly, the R.F.C. has its tail well up: in fact the Corps might adopt "*sursum cauda*" as a supplementary motto. The newly arrived pilots are better trained both in flying and fighting, and are therefore better fitted to back up the more experienced men to whom they are sent as reinforcements. This naturally gives them confidence in themselves, and gives their flight and squadron commanders confidence in them.

Both the old and new hands are far better mounted than they were in the past, as the Hun knows to his cost. All the old machines, about which so much trouble was raised a year, or even less, ago, have vanished, except a few which are retained for certain specific purposes, for which they are particularly suited and which need not be explained.—This is mentioned merely in case someone who is out looking for trouble happens to see or hear of such being still in service.

Some types of aeroplanes which were doing good work a year ago are still in use as fighting machines, though newer machines which are faster and climb

higher are being used to a greater extent. This also is in accordance with the needs of the Corps, for sheer speed and climb are not everything in air fighting under modern conditions, and for certain kinds of fighting quickness in handling is more important than anything else. This fact is equally recognised by the enemy, as is proved by the fact that their star turn, Lieut. Voss, when brought down on our side of the lines, was flying a Fokker triplane, fitted with a French-built 110 h.p. Le Rhône engine. His machine was slower than most German "chasers," but he evidently preferred extraordinary manoeuvrability to pure speed on the level. This should be noted by those who are surprised that Nieuports and "Pups" are still used, although slower than many later machines.

Apart from such machines the fighting patrols of the R.F.C. to-day are mounted on aeroplanes which are faster and better armed than are the Hun fighters. Probably none knows better than the Huns themselves how much faster and better in every way the modern Bristols and de Havillands are than the corresponding German types, and even than the fastest German chasers.

#### ORGANISATION.

Apart from such excellent reasons for confidence in themselves the whole organisation of the R.F.C. in the field is such as to hearten the men who are doing the flying. There is now no waiting for machines as there used to be in the old days. Whoever may have to wait for new machines at home, the squadrons at the front are kept fully supplied. It is obviously better that the departure of a new and untried squadron from England should be delayed for a few days or a few weeks because the machines intended for it are sent out to experienced squadrons at the front, than that the said experienced squadrons should be short of machines, and so lose their enthusiasm through inactivity, or lose confidence through depletion of their numbers.

#### ECONOMY.

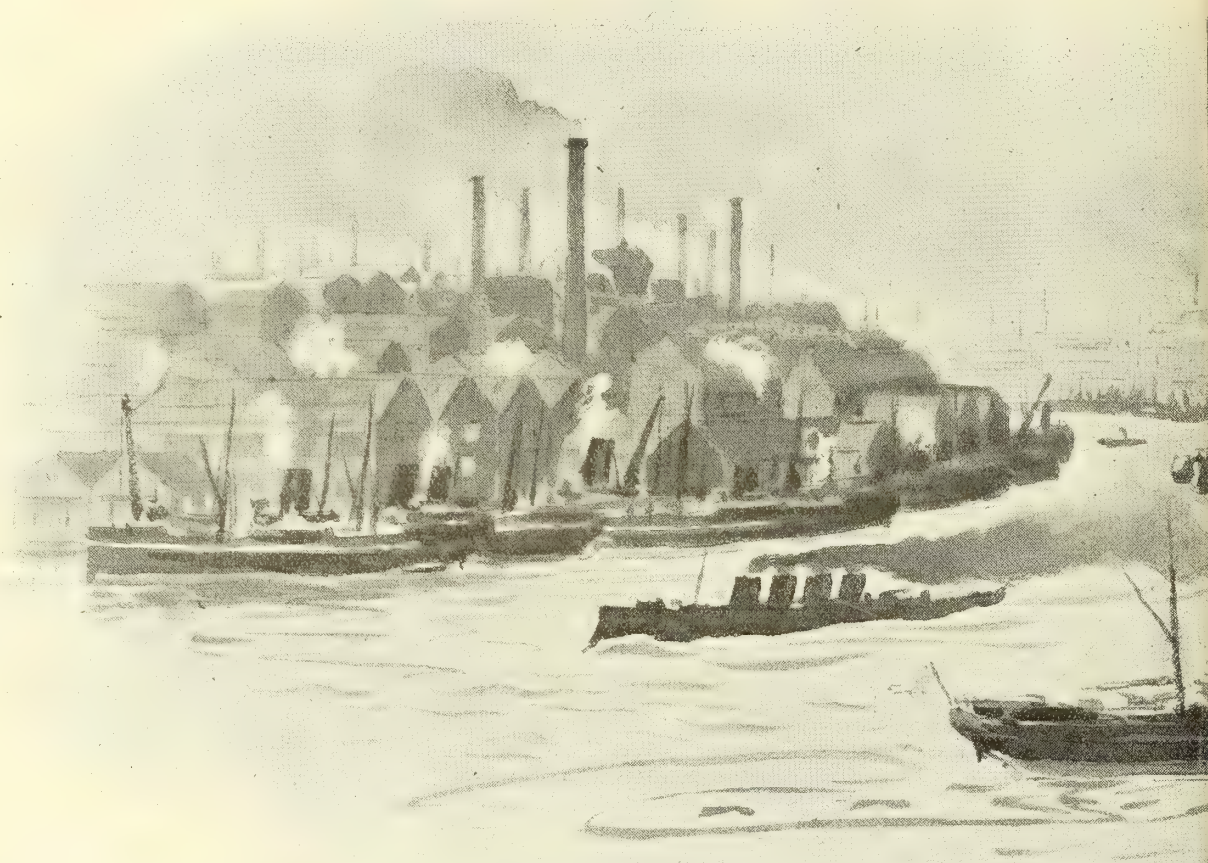
Apart from the supply of new aeroplanes from home the R.F.C. abroad has a wonderful system of supplying itself. Those who are accustomed to the wicked waste of time and labour and material, chiefly caused by an honest but mistaken attempt to achieve perfection in



R.F.C. Air Mechanics in Training on Engine Work.



The view from the Victoria  
less energy & tireless enter



AND IN NO PLACE IS  
———— THAN INSIDE

John Dawson & Co

Phones:

CENTRAL 2604.

2605.

CITY 16.

CENTRAL 1145

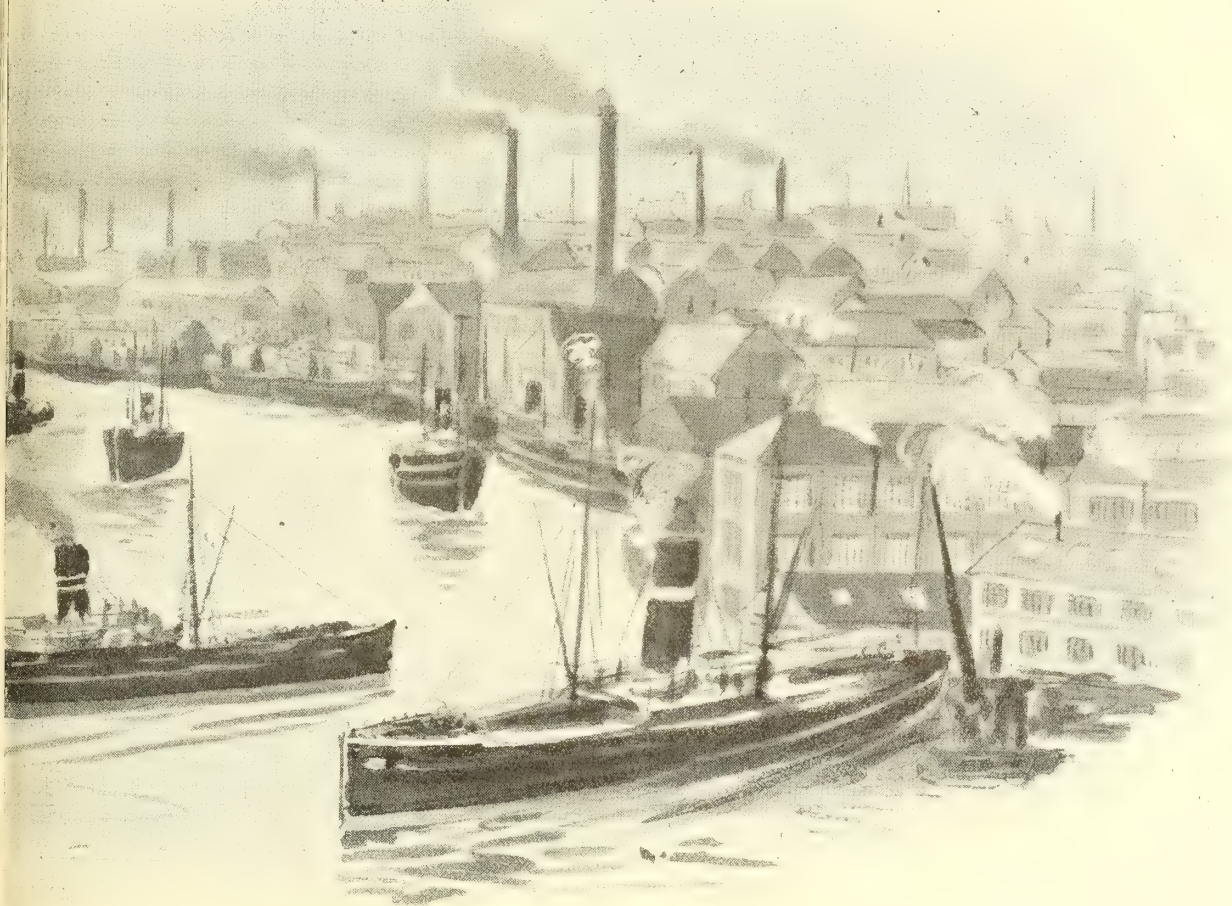
" 1165

AIRCRA

VICTORIA WORKS:



Works is typical of the cease-  
prise of the "Canny North"



THIS MORE EVIDENT  
THE WORKS OF—

pany (NEWCASTLE  
ON TYNE) Limited

FTSMEN,  
NEWCASTLE-ON-TYNE.

Telegrams :  
"DEPENDABLE,  
NEWCASTLE-ON-TYNE"





The view from the Victoria Works is typical of the ceaseless energy & tireless enterprise of the "Canny North"



AND IN NO PLACE IS  
— THAN INSIDE

John Dawson & Company (NEWCASTLE ON TYNE) Limited

Phones:

CENTRAL 2604.

CENTRAL 1145

CITY 16.

2605.

"

1165

VICTORIA WORKS:

AIRCRAFT

ENGINEERS,  
NEWCASTLE-ON-TYNE.

Telegrams:

"DEPENDABLE,  
NEWCASTLE-ON-TYNE"

Works is typical of the ceaseless energy & tireless enterprise of the "Canny North"



THIS MORE EVIDENT  
THE WORKS OF —

# THE 'Guardian Angel' Parachutes



FALL OF NEARLY 4,500 FEET.

PARACHUTE OPENS 100 YARDS FROM EARTH.

The Press Association's special correspondent at the French Headquarters in France writes:—

"We have observed many thrilling incidents during attacks on captive balloons at various parts of the front. In one case in particular, on the eastern frontier, one aerial observer, when his balloon burst into flames, threw himself out, relying on his parachute, which did not spread out until he had fallen nearly fifteen hundred yards.

"Everybody on the ground believed he was doomed, when suddenly, when he was within a hundred yards of earth, the parachute opened and brought him gently down. He was picked up unconscious. In general, however, the parachute works perfectly, and the dart through the air is made in safety, without anything more than the momentary thrill of falling through space for a short period without any support."

## WHY THE ORDINARY PARACHUTE SOMETIMES FAILS TO OPEN.

The above terse account is remarkable in that the depth of fall, terminated by the actual opening of the Parachute, surpasses by some thousands of feet any previous record. There are, however, many records of Parachutes having fallen a greater depth, without having opened at all.

There are two main causes which, in the case of the ordinary Parachute, account for a delay or an entire failure to open. The first main cause is that the aperture at the apex of the body acts as a very efficient air ejector, and the suction creates a partial vacuum within. When the weight of the Airman first comes on the rigging it pulls the cords together, and if, by any malign chance, the silk gussets at the mouth of the Parachute should overlap and be pressed together by the opposing current of air, the vacuum extends to the mouth, sucks the silk gussets together and seals up all entrance of the external air. A Parachute in such case never opens, and the Aviator falls to certain death.

This partial vacuum is *always present* at the beginning of the fall of the ordinary Parachute, and the strength of the vacuum, and its potency for evil, increase with every foot of fall. Unopened, the Parachute falls 16 ft. in the first second, 48 ft. in the second second, 80 ft. in the third second, the vacuum within increasing in the same progressive ratio. At the beginning of every drop, the suction of the vacuum can be seen by a close observer (and is recorded by the biograph film) to extend downwards to nearly half the length of the silk body, and that then begins a struggle between the vacuum at the top and the external air trying to make an entrance between the fluttering gussets at the mouth. Once the air gets well in, it forms a little ball near the mouth, which enlarges by tearing apart the sucked together gussets in the upper portion. Then the vacuum is vanquished and the Parachute opens. But in the case of every drop there is this struggle between internal vacuum and external air pressure. Sometimes the vacuum disappears almost in a moment; sometimes the struggle is prolonged, thus accounting for the great variation in the depth of drop before an ordinary parachute opens. Sometimes, fortunately very rarely, the vacuum wins—and another fatality has to be recorded.

The second main cause, accounting for the failure of the ordinary parachute to open, is entanglement of the rigging, which is composed of fine coiled cordage. Now when a large number of coiled cords are laid alongside in contact, their propensity to lay hold of one another *and grip* is nothing short of diabolical. When the weight of the descending Aviator makes a snatch at this cordage, all bunched together, the least air current will whip these cords round each other, with the imminent risk of their loops taking a grip and binding themselves in knots. A partial entanglement of rigging means a lop-sided parachute body, and a dangerous increase in the speed of descent. A bad knotted entanglement means constriction of the mouth of the parachute, and a high speed fatal fall.

In the example under notice, no explanation is offered of the cause of this remarkable fall; but the circumstances point almost certainly to entanglement of rigging, for the following reasons:—

If the fall had been due to suction of the body together by vacuum, at 4,500 ft. the Airman



would have been falling at a speed of about 536 ft. per second. The sudden opening of the parachute at that speed would have infallibly burst it.

In the case of entanglement, the air is not necessarily prevented from entering the body of the parachute, which expands to the extent permitted by the entangled cordage, and so develops a certain amount of resistance. That the Aviator was alive but insensible indicates an extremely high, but not a fatal, speed of fall. If he had fallen 4,000 ft. without appreciable resistance from the Parachute, he would have been dead long before reaching that depth, from nerve-shock and suffocation.

The final opening out of the Parachute was due probably to the gradual unravelment of the tangle through vibration set up in the cordage by increasing speed of fall. The escape of the Aviator from death can only be described as due to unparalleled Good Luck.

#### WHY THE "GUARDIAN ANGEL" PARACHUTE CANNOT FAIL TO OPEN.

We have set out above, for the consideration of Aviators, the risks that are ever-present in a dive with an ordinary Parachute. They may be latent, but they exist always in every drop that is made with one. The percentage of fatal accidents is fortunately small, but the variation in the depth of free-fall is a constant experience. A short fall, before the Parachute opens, shows that in that individual instance the risk has quickly passed away; a long fall indicates intimate and prolonged peril; for the further the depth of fall, the greater is the probability that the Parachute will not open at all.

All these risks are absolutely eliminated when the "Guardian Angel" Parachute is used. Long before the war the risks were realised and understood by the inventor, and it was to eliminate these that he designed the "Guardian Angel" Parachute, and three years ago submitted it to the then existing Air Authorities, who, however, seemed unable to realise that what the inventor had accomplished possessed important practical advantages.

With the first foot of fall the ordinary Parachute begins to create a partial vacuum within its body—which increases in intensity with every further foot of fall. With the first foot of fall the "Guardian Angel" Parachute begins to create compressed air within its body, which increases in pressure with every foot of fall, and the parachute is thus opened by irresistible internal forces.

The Ordinary Parachute employs coiled cordage, which falls in a loose bunched-up mass, churned up by the air-current, and liable to be knotted together when pulled taut by the weight of the Aviator. The "Guardian Angel" Parachute employs obliquated tapes, which issue cone-wise under a continuous tension (which gives immediate support to the Airman), and so do not touch one another in the fiercest air current; consequently, entanglement is thus made physically impossible.

With the Ordinary Parachute, even if it opens at the first intent, there is never a less depth of free-fall than 100 feet; more often of 200 to 300 feet; not rarely of 500 feet, and a free-fall of 4,500 feet is now shown to be not impossible. A free-fall of even 100 feet is a terrifying and nerve-racking experience, producing appreciable shock effect. After a deep fall, the nerve-shock is very grave, taking long to recover from, and often leaving permanent serious injury.

With the "Guardian Angel" Parachute there is no free-fall beyond the length—13 ft. 6 in.—of the shock-absorber sling—the depth of a spring-board dive into a swimming-bath. When the Aviator has dropped that short distance the Parachute at once commences an effective support which increases so rapidly in degree, that in two and a half seconds he finds himself fully supported in the air, descending quite comfortably at the safe landing speed of 15 feet per second. He experiences no nerve-shock whatever, but, on the contrary, finds the dive in the "Guardian Angel" Parachute a perfectly pleasurable sensation, which, once made, dispels all fancies that there can be any serious risk attending the venture. The outstanding impression left by the experience of the first drop is absolute confidence in the reliability of the apparatus.

Flying Officers are thinking men, with the closest practical experience of the phenomena of the Air. Will they think these points over, and then ask to be supplied with that parachute which accords best with their own views of what is good engineering and common sense?

**IF THE "GUARDIAN ANGEL" PARACHUTES ARE NOT THE BEST—LET THE BEST BE BROUGHT FORWARD AND TAKE THEIR PLACE.**

Will Flying Officers please note that, as our entire output is being taken up by the Air Board for the use of the British and Allied Air Services, applications for Parachutes and Harness should be made, through their Commanding Officers, to the Air Board, and not direct to us.

RELIABILITY—first.

RELIABILITY—second.

RELIABILITY—ALL THE TIME.

## E. R. CALTHROP'S Aerial Patents, L<sup>td.</sup>,

ELDON STREET HOUSE, ELDON STREET, LONDON, E.C.2.

Telephones (2 lines) London Wall 3266 and 3267.

Telegraphic and Cable Address—"Savemalivo-Ave-London."

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



material, and to attain super-perfection in workmanship by means of absurd limits of sizes and unnecessary rules and procedure in the Inspection Department, would be astonished at the economy and efficiency effected by the R.F.C. on its own account.

When a machine is crashed, even sometimes right up in the firing line, its remains are rescued and handed over to the salvage people, who use every scrap of it which is usable. It is long since we heard of the German authorities issuing orders to troops to save all spent cartridge cases and broken bits of metal, and when that order was made known our assinine press hailed it with joy as evidence that Germany was short of metal and would soon be beaten. It was, in fact, merely another proof of German common sense and efficiency. Only a few days ago the said press published a precisely similar order issued to British troops at the front, but we know, without being told by the newspapers, that in our case also true economy and not metal-famine is the reason for the order.

In the case of the R.F.C. a highly organised salvage system has been in use for a long time, though nothing has been said about it in print. One has heard in this country of brand new machines being delivered minus engines—after being subjected to all the usual rigorous inspection and procedure—and then being solemnly burnt, to save housing room. In some cases—not R.F.C.—one has heard of machines actually being delivered to air stations, and then being burnt as they stood, after the engines only had been removed. It is very unlikely that such things will ever happen again under the present regime, but it is worth noting that such things *have* happened since the R.F.C. in the Field instituted its own system of salvage.

#### RECONSTRUCTION.

Everything saved is used to the best possible advantage. The various parts which are usable go into beautifully organised stores, whence they are issued to squadrons for spares, or else are handed over to the R.F.C.'s own workshops to be built into new or reconstructed aeroplanes. Even damaged big parts, such as spars, are cut up and used for small parts. And it is particularly worthy of note that in many cases the aeroplanes thus reconstructed from bits of wrecked machines, plus a small amount of new raw material, have put up a better performance than did any of the machines to which the salvaged parts originally belonged.

Which is probably due to the fact that the work is done by men under proper discipline, working with good will for people whose daily risks they share, and inspired by admiration of the pilot whose good work protects them from the enemy. In spite of their only drawing a soldier's pay and their keep, and living the ordinary soldier's life in huts and billets, they do more work and better work on the average than do the pampered hands in aeroplane factories, with their exorbitant pay, their strikes, and their continual discontent.

#### A HUMBLE SUGGESTION.

It is perhaps natural that the immediate proximity of the enemy should have an inspiring effect on men working on war material, but in the case of the R.F.C. mechanics one feels that the quantity and quality of their work is chiefly due to plain honest loyalty to the Corps and to their officers. At the same time one cannot help feeling that it would do a power of good to some of the young and well-paid Grade I men in aircraft factories if they were sent out as R.F.C. mechanics to work in the R.F.C.'s own workshops, within constant hearing of gunfire and within easy reach of enemy bombs. They might then change their minds slightly as to the immediate need for putting their best energies into their work.

There is some talk of calling up for the Army all men between the ages of 19 and 24, regardless of whether they claim to be skilled men or not. If this idea had been put into force early in 1915, we should have had more really skilled mechanics in this country and less of these young shirkers, and considerably less trouble with strikes and labour agitations. One would like to suggest that if it is actually adopted at this late date all the aircraft workers who are not actually Grade



A Greeting from No. 1 Aircraft Depot.



If men should be put into R.F.C. workshops, and that some of the older men in the R.F.C. should be released for aircraft factories at home. The exchange would do good, for the young men would be taught the real meaning of work, and the ex-R.F.C. men would be a very healthy influence in the aircraft factories. This, however, is merely by the way.

Meantime, the point is that the Nation's resources are very much more economically used on active service than they have been at home, though one hopes that under his reorganisation of aircraft production Sir William Weir will institute a system such as that which has been so long in vogue on active service. Incidentally one feels that apart from the labour question being non-existent at the front, much of the economy and efficiency is due to the finished article being judged purely from the point of view of plain practical common-sense, without interference from high-falutin' theorists.

#### APART FROM AEROPLANES.

All that has been said about the reconstruction of aeroplanes and the salvage of aeroplane parts holds equally good in reference to engines, instruments, guns, cameras, and everything else connected with aeroplanes. R.F.C. mechanical transport is treated in exactly the same way. Motor lorries, light tenders, staff cars, winch-tenders, motor-bicycles, and everything else is salvaged, repaired, reconstructed, overhauled, or merely tuned up, as the case may be, by the R.F.C. itself. And the jobs are thoroughly well done.

#### K.Bs.

The kite-balloon people have their own particular shops, where they repair or rebuild their balloons, produce their own hydrogen, fill their own cylinders, make their own baskets, pack their own parachutes, and, in fact, run their own show just as efficiently and effectively as do the other branches of the Corps.

Quite wonderful people in their own way are the K.B. folk, and those who think that K.Bs. are a rest-cure for nerve-shattered aviators are mightily mistaken. It takes quite a lot of nerve to sit in a basket and be sniped by 5.9 shells for several hours a day, with the added prospect of having to do a hurried parachute jump from 4,000 feet or so if a Hun aviator does happen to get past our own aeroplanes and Archies, and get a few shots home on the balloon. Which latter unpleasantness is increased by the Hun habit of potting at the parachutist as he goes down. One has come across cases of aviators who took to K.Bs. because they thought their flying nerve had gone, and who, after a couple of months of K.Bs., begged to be allowed to return to aeroplanes. And one can quite understand them.

#### HIGHER EDUCATION.

So much has been preached about German efficiency and German system and so forth—and very justly so—that one is a trifle apt to forget that when the British soldier is allowed to have his own way, unhampered by politicians, he can be as systematic as any Hun, and far more philosophical. It has been said that when German aviators are showing signs of wear, they are sent to a special sanatorium, somewhere up towards Bruges, and that visitors to that district can find them sitting in hundreds along the banks of the local canal fishing—that being the particular form of rest-cure prescribed for them, though not perhaps at this time of year. One has not heard of any such system in France for tired British aviators, but one may perhaps be permitted to say that the higher education of our aviators is carefully maintained. Probably they are pulled out of the fighting area for such education before they reach

the stage when a good-looking fish is their last resort. Anyway, quite a lot of interesting training is done in France. Observers are taught to fly, machine-gunners are taught to observe, new pilots are taught to fight, squadrons are taught new manoeuvres, and so on.

The latest dodges in aerial gunnery are also developed in France. And, incidentally, from what one has heard, the gunnery school in full blast must be very much funnier than a pantomime and the Earl's Court Exhibition combined, while being at the same time highly educative. But, one imagines, it is hardly a rest-cure for nerve cases.

#### PERMANENT INSTITUTIONS.

In that delightful story, "The Captive," Mr. Kipling's general talks calmly of putting the British Army through the Boer War in batches by way of training for something bigger—this war, in fact, which most sensible people saw coming. The general spoke of his men in "vintages" of the different years in which they had come out to South Africa.

Somehow the systematic way in which the R.F.C. goes about its work on active service reminds one of that story. The late K.-of-K. told us to prepare for a long war. The wiser leaders of opinion in this country have more recently repeated that injunction. Apparently the R.F.C. High Command made up its mind to the same effect some time ago. The permanence of the institutions behind the lines, to which reference has been made, shows the outcome of such a decision.

If the war ends to-morrow these institutions will have paid for themselves handsomely, and they will also have paid the local French population handsomely by existing in its midst. If the war goes on for another four or five years, which it may quite well do, to the ultimate benefit of the soul of the British Empire, even if to the ruin of its pocket, those institutions will pay for them-



"Archie," sketched by an R.F.C. Mechanic from a photograph.



selves still better, and the excellent system on which they are organised is capable of expansion to any extent which may be necessary to handle the demands of the vast air fleets which will then be in use.

#### THE LIGHTER SIDE.

With all this excellent system and organisation behind them, and with commanding officers in whom they have absolute confidence, it is, therefore, not at all surprising that the squadrons of the R.F.C. feel pleased with themselves, and, instead of brooding over the "perils of the air," as some would have us believe, find time to take an interest in the lighter side of things, and in the minor tragedies of life.

A cheerfully ignorant visitor to a fighting squadron the other day expressed innocent surprise at seeing a fierce football match in progress on an aerodrome—the ground was frozen as hard as iron, and Rugger was being played at that. "Yes!" growled the C.O., "I have a dam' sight more casualties from footer than I have from the Huns."

At another squadron the same visitor approached a Nissen hut whence proceeded sounds which suggested that a Labour Conference or a Russian Peace Delegation was at work inside. Further investigation showed that the cause of the riot was a ping-pong match between the star turns of two rival flights.

Incidentally, the R.F.C. appears to take a lively interest in the uniform-to-be of the new Air Force. A Canadian aviator-artist, whose genius for mural decoration appeared to pervade all the public Nissens of that squadron, had produced a suggested design which should really be considered by the Air Council. He had combined in some extraordinary way the general effect of Mercury on the fountain in Piccadilly Circus, with the costumes of a toreador, a tram-conductorette, a Bersagliere, and a bicyclist. The effect was distinctive, the design chaste in the extreme, and the colouring such as to deserve the envy of the great Comelli. The visitor was convinced that even if, in the words of a distinguished officer, "Dress is the lowest form of soldiering," it may inspire the highest flights of artistic fancy. *Vide* the popularity at the front of the work of the late Mr. Raphael Kirchner—but perhaps that should be expressed the other way round.

Of the minor tragedies one must tell the tale of a young officer who returned to the R.F.C. in France from leave and a brief honeymoon, looking more downcast than even the leaving of his bride justified. His was indeed a tale of woe. It appears that he had contracted to bring from England an authentic Norfolk turkey for the Christmas dinner. The day before he left England he had taken two perfectly good stalls at a London theatre. He arrived in the evening at a London terminus, intending to leave the trussed turkey in the cloakroom of a tube station, dine, go to the theatre, and catch

the leave train early next morning, after retrieving the turkey.

Just as he was going down to the tube station an air raid warning went off. Several thousands of people, who were just on their way home from business at the time, obeyed the police injunctions and took cover at once, with the result that the turkey was "killed in the crush," so to speak, and trampled under foot. Also, the tails of the officer's dress coat were grabbed by some hysterical alien, and, like Judas, burst asunder in the midst, so that finished his dress coat. So he lost his turkey, he lost his dinner, he lost his theatre, and he lost his dress coat, and all because of the raid. Thus the Huns may claim that their pre-Christmas raid caused definite military damage. And after he had told his tale of woe an unpleasant person in the room remarked: "But, good Lord! man, all the shops in Bailleul are full of turkeys." And they were.

Turkeys in France were 1 franc 50 per kilo—which is about 7d. per pound. Think of that, ye London housekeepers, who paid 40s. apiece for them.

Another minor tragedy was that of an officer who was living in a canvas hut during the very cold weather, and could never get warm. But the last blow fell on him when he woke up one bitter morning to find the glass of water into which he had put his false teeth frozen solid with the teeth in the middle, like a fly in amber, and no earthly means available of thawing them out. The subsequent interview between him and his



"ABSENT FRIENDS."—R.F.C. Prisoners in Germany.



batman was, unfortunately, not recorded phonographically.

#### RECENT DEVELOPMENTS.

All that, however, is very much by the way. The fact remains that the R.F.C. in the Field knows that it is top dog in the air at present, and does not feel at all nervous about the threatened Hun air offensive in the spring. And, one can assure those on active service that—barring traitorous acts by British workmen—there need be no fear for the supply of new and up-to-date aeroplanes which the Corps will need. The development of two very opposite forms of air offensive of late indicate the self-confidence of the R.F.C. in the Field.

Night-bombing, which used to be regarded as the very worst job a pilot could undertake, is now done as a matter of course. One has even heard pilots who are not given to "hot-airing," say that they like it better than any other work, as it is more fun annoying the Boche at night than attacking him in daylight.

At the other extreme one finds pilots who regard it as the highest form of sport to fly at a mere fifty feet from the ground and squirt bullets into Hun troops. It appears that both forms of attack are equally obnoxious to the German; in fact, as regards night bombing, there seems little to choose between the feelings of German soldiers—as expressed in captured letters—and the feelings of the alien population of the East End of London. Which is rather curious, because, after all, the German soldier is a good fighting man.

In any case, we may expect to see both these forms of attack very greatly developed by the Germans in 1918, for whatever our people do first the Germans always try to go a few better. But, no matter how much the Germans develop on these lines, one may be confident that the R.F.C. will beat them at it—always provided that the workpeople at home back them up.

#### PILOTS FROM THE DOMINIONS.

No tribute to the R.F.C. would be complete without reference to the work done by pilots from the Overseas Dominions. Australia has her own Flying Corps, which has done very fine work. Its first squadron was the aerial mainstay of the army in Mesopotamia during that dire first period. Later squadrons did equally well in Egypt. And now one has heard of performances in the Cambrai battle by a purely Australian squadron, commanded by one of the earliest Australian aviators, which rivals, if it does not indeed excel, the work of any other R.F.C. squadron. At any rate, one does not recall any other squadron accumulating so many decorations in one day's fighting. It will be equally pleasing to Australians to know that other Australian squadrons have distinguished themselves highly in the less exciting though possibly more nerve-trying work of artillery observation.

Those who used to have doubts as to the amenability of Australians to discipline should see for themselves the work achieved by the Australians by their own methods. In proof of the keenness of the Australian

Flying Corps one may mention that whenever a fresh batch of the A.F.C. has arrived in this country, the office of this paper has been constantly visited by Australian air-mechanics seeking the names of books, regardless of price, from which they could learn more about their jobs, in theory and practice, than they could pick up in the ordinary course of training. Many of them are trained engineers of high education, and, even among those who are not, it is nothing for a man to lay out four or five pounds on technical books for his own enlightenment. One doubts if many British flying officers are so keen as to spend as much on purely technical information.

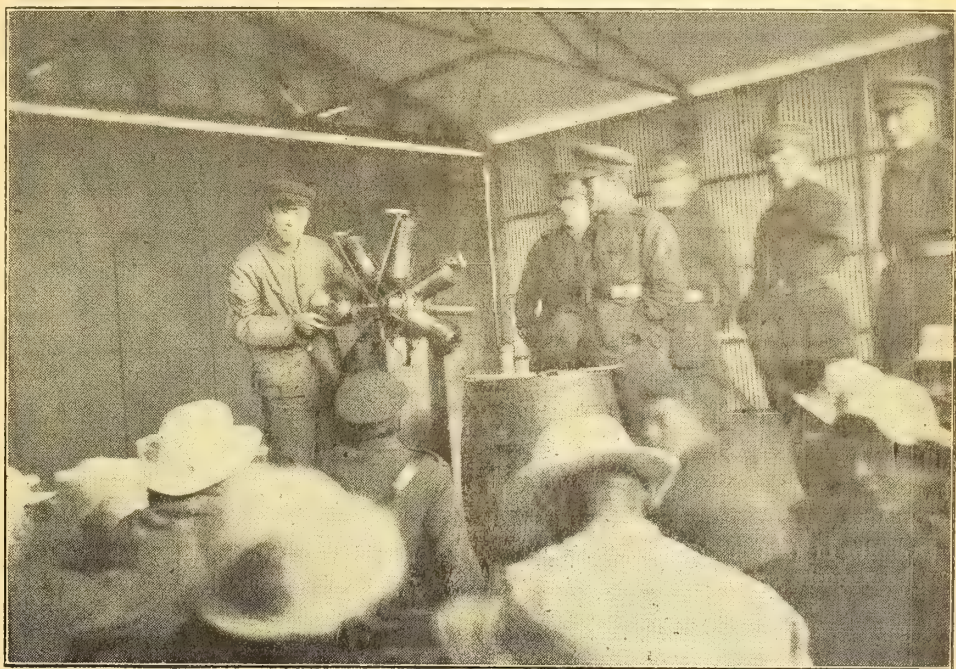
Anyhow, whether as pilots or as mechanics, the Australian people have good reason to be proud of their Flying Corps.

Canada has not yet risen to a flying corps of her own, but certainly sufficient Canadians have joined the R.F.C. to man several squadrons, if all Canadian pilots were collected together. And it is worthy of note that as air fighters the Canadians have done extraordinarily well. They appear to be born fighting men, full of pluck and dash, and withal able to use their heads as well as their hands and feet.

There are many New Zealanders in the R.F.C., some of them in the Australian squadrons, and they also have upheld worthily the reputation of British aviators from South of the Equator.

South Africa has a small Flying Corps of her own, and a South African squadron did well against the Germans in South-West and in East Africa, winning decorations and honours. Also there are many individual South Africans in the R.F.C. in France, among them being at least one distinguished officer who as a boy fought against British troops in defence of his own country. These South Africans have won a goodly number of medals, crosses, and orders, and the small European population of South Africa may safely feel that it has done its full share in upholding the R.F.C.'s present superiority in the air.

One gathers that people from the Overseas Dominions object to being called Colonials. A Roman "Colonia" was an outpost of the Roman Empire, and one of its chief safeguards against the influx of the barbarian. In that fine sense our overseas pilots have proved themselves true Colonials.



TRAINING IN THE DOMINIONS.—Australians under instruction at Point Cook.



### HOME TRAINING.

Naturally these developments of future air war will demand a mighty increase in personnel as well as matériel, and it is eminently satisfactory to know that the training of pilots, observers, equipment officers, and mechanics is going ahead at a pace which is more than satisfactory. The "Gazette" made known some time ago that the Home Training establishment, which was a brigadier's command early in the year 1917, is now a division, commanded by a major-general with several brigadier-generals under him, but even that can give the enemy only a very slight clue to the immense developments which have taken place.

On any fine day almost anywhere in the country one sees more aeroplanes in the air than one meets cars on the road. Practically all those aeroplanes are training machines, and it must be remembered that in addition there are the training schools in Canada, in Egypt, in Australia, and in France, all turning out more and more pilots.

But, what is more important still, the system of training pilots now in vogue is thoroughly effective, and is being improved daily. Not only are the new pilots trained very much more quickly than ever before, but they are very much better trained. The new system has, moreover, the advantage of being far more economical in machines and in the number of men necessary to look after them than was the older method. One gathers that an Irish officer of the R.F.C.—a very early pilot—was responsible for the introduction of the new system, which was promptly taken up by the present Director-General of Military Aeronautics, when he commanded the Home Training Division, and that the present G.O.C. Home Training, himself an exceptionally brilliant pilot with a fine active-service record, is developing it still further.

The training of other personnel is proceeding on equally intelligent and efficient lines, so that however great the threatened German effort may be in the spring the R.F.C. should be able at least to hold its own, and whatever France and America are ready to do by that time will be precisely so much to the good. Which is quite a comforting thought.

### HOME DEFENCE.

The subject of home training naturally suggests Home Defence. Though strictly speaking the Air Defences are under the Field-Marshal Commanding-in-Chief Home Forces, and are not under the Air Ministry, nor wholly under R.F.C. command, they are so closely allied to the R.F.C. that it may be permissible to mention them in this article.

There are those who seem to think that if three or four Hun raiders out of twenty or thirty penetrate the London defences and drop a few bombs the fact is evidence of inefficient defence. As a matter of common sense, if one considers London's perimeter of well over 100 miles, and the fact that hostile machines can attack at any level up to about four miles, the marvel is that so few get through.

Roughly, one may say that the London defences have to cover a vertical screen some 400 square miles in area. If twenty machines attack, that means twenty square miles of screen per machine. Think of it that way, and it seems a miracle that either searchlights, guns, or aeroplanes ever find any of them in the dark.

In spite of this immense difficulty the bag of raiders has been quite considerable. The guns have done most

of the damage to the raiders so far, but it is now established that in the raid just before Christmas, the Gotha brought down was the victim of one of our night-flying aeroplanes. This should be a distinct encouragement to pilots and mechanics alike, who may, perhaps, have felt that they have been rather wasting their time on Home Defence work, when they would rather have been in the more cheerful climatic and mental atmosphere of France. Moreover, methods of aeroplane defence against raiders are improving, so that defensive aircraft are likely to play a still more important part in the future, both at home and abroad.

The work of the Archie gunners and their attendant searchlight artists has been extraordinarily good. One gathers that the Germans themselves think more of their work than do the populace of London. At least, so one may judge by the refusal of the majority of German pilots to face the music. The fact that an occasional gunner forgets to arm his shell before loading his gun, or that an occasional dud fuse occurs, is more evident to the Londoner on the ground than to the Hun in the air. Such accidents happen even to German gunners and shells.

On the whole, the grumbling Londoner has much for which to thank the G.O.C. Air Defences, and perhaps the Londoner will realise the fact better in the spring, when the promised "kolossal" Hun raids begin, with the four and six engined Gothas, and are met by still further improved defences.

### THE MINOR WARS.

To the individual it matters little whether he is killed in London, France, or Mesopotamia, but, all the same, it may seem invidious to regard France and London as the main areas of air war. Such, however, is the fact, and from the point of view of the ultimate end of the war, all other areas must be regarded as minor wars.

In all these minor wars the R.F.C. has acquitted itself in a manner worthy of a Royal Regiment in the King's Army. The latest news from the latest war area in which the R.F.C. has appeared—Italy, to wit—is that in the first encounter with the Huns, the R.F.C. came out very distinctly on top.

In the Balkans the R.F.C., under a very gallant officer, who probably holds the earliest aviator's certificate of any man now flying, has done very fine work. To the credit of this detachment stands the bringing down of the first Gotha ever captured by an enemy, and, unless one is mistaken, two of these machines were brought down in the same day by one clever young officer single-handed.

In Egypt, and now in Palestine, the R.F.C. has been putting up a very fine performance under appalling difficulties as regards transport of supplies and spares. Detachments from the same brigade, operating in Mesopotamia, have done practically all the air work for the victorious army of the late and much-lamented Sir Stanley Maude.

One has heard little about other war areas, such as German East Africa, or Arabia, or the Soudan, during 1917, and it seems as if the R.F.C. are no longer needed in those parts. But if they are needed one may rest assured that they are doing their work as well and as cheerfully as are those in France.

Wherever the R.F.C. may be they are always cheerful, and never more so than since the general improvement set in during 1917. Therefore, one does not hesitate to wish the Corps as a whole a Happy as well as a Victorious New Year.—C. G. G.



## The Air Council and its Task.

Those who have been feeling anxious about the composition of the Air Council must be considerably reassured by the official announcement which is appended hereto.

By Order in Council of Jan. 2nd, the Air Council has been established as from Jan. 3rd.

The Council is constituted as follows:—

Lord Rothermere .....	Secretary of State and President of the Council.
Major-General Sir H. Trenchard, K.C.B., D.S.O. ....	Chief of the Air Staff.
Rear-Admiral Mark Kerr, C.B., R.N. ....	Deputy Chief of the Air Staff.
Commodore Godfrey Paine, C.B., M.V.O., R.N. ....	Master-General of Personnel.
Major-General W. S. Brancker .....	Comptroller-General of Equipment.
Sir William Weir .....	Director-General of Aircraft Production in the Ministry of Munitions.
Sir John Hunter, K.B.E. ....	Administrator of Works and Buildings.
Major J. L. Baird, C.M.G., D.S.O., M.P. ....	Parliamentary Under Secretary of State.
Lieutenant-General Sir David Henderson, K.C.B., D.S.O. ....	Additional member of Council and Vice-President.
Mr. W. A. Robinson, C.B., is Secretary to the Council, and Mr. H. W. McAnally Assistant Secretary.	
Sir John Hunter, K.B.E., will continue to perform his present duties in the Ministry of Munitions, in addition to acting as Administrator of Works and Buildings in the Air Ministry.	

The appointment of Maj.-Gen. Sir Hugh Trenchard as Chief of Staff places him in a position as regards the Air Force analogous to that of Sir William Robertson, the C.G.S., in relation to the Army. Which means that he is virtually Commander-in-Chief, albeit working with a Committee instead of over a Staff, as was the Army custom before the microbe of democracy produced an epidemic of committees. Whether as Commander-in-Chief or as Chief-of-Staff no other appointment to the post could be as good, for Gen. Trenchard is the strong man of the Flying Services, and has the complete trust and confidence of all those who have served with or under him. So in this the War Cabinet could not have done better.

As Deputy Chief of Staff, Admiral Mark Kerr should be a distinct success. His personal experience of flying dates back to 1912 or so, and his interest to 1909. In 1914, while commanding the Greek Navy, he took his certificate as a seaplane pilot, and though over fifty years of age he proved himself to be a really good pilot, and not merely one of those who scrape through certificate tests to qualify for jobs in the Flying Services.

Over and above his flying abilities and the mental and physical qualities which made them possible, Admiral Kerr is a distinguished Naval officer, with war experience in Egypt in 1882 and in the Soudan in 1891. Also, certain of his navigating feats when in the command of ships at sea are matters of Naval history. Furthermore, he is a strategist—which is none too common in the senior ranks of the Navy—and holds views on naval and aerial methods which may have far-reaching effects during the next few years of the war.

Commodore Godfrey Paine's appointment as Master-General of Personnel will be welcomed by all the old hands in both the Flying Services. As the first Commandant of the Central Flying School in 1912, he had the handling of soldiers and sailors simultaneously, which difficult task he performed with marked success. He and Sir Hugh Trenchard—then an infantry major—together made the C.F.S. a model establishment for its period, and their cordial co-operation then augurs well for their work in the Air Force. When the R.N.A.S. started its own big training station, Commodore Paine was equally successful in handling personnel, and during the past year, as Director of Air Services, he has done splendid work in building up the strength and improving the efficiency of the Naval Air Service.

General Brancker as Controller of Equipment should find himself in a position eminently suited to his talents. As a pilot of great experience and constant practice, as an artillery officer of distinction, as an organiser of proved ability, and as a man of foresight, who believes that a dominant air fleet is vital to this country, he is fully qualified to take charge of the equipment of the Flying Services. He knows what the service aviator needs, and he has a habit of getting what he wants. Therefore his return will gratify the majority of people in both Services.

### PRODUCTION.

As Director-General of Aircraft Production Sir William Weir has probably a better chance of success than any other possible holder of the position. His task is difficult, including as it now does, all technical affairs in addition to his former work of Supply. Nevertheless, his outstanding success in the Supply

branch, in spite of the difficulties of the past year being increased by shortage of material and an overplus of labour troubles, gives one confidence in his ability to make good. He has, at any rate, the confidence of the Aircraft Industry, which recognises in him an engineer and a business man who knows that the nation owes a square deal to "Trade" designers and manufacturers.

There are those who do not hesitate to say that Sir William Weir has, in the vulgar phrase, "bitten off more than he can chew," and that he must either fail departmentally or break down himself. Either fate would be a calamity, but neither is expected by those who know him best. In such a task much must depend on subordinate officials, and Sir William Weir has shown himself to be an adept not only in choosing his subordinates, but in getting rid of those who do not fulfil his ideas or ideals. There is still a good deal of scrapping of human material for him to do, and one may expect to see it done. In his capacity as Controller of the Technical Department Sir William's brother, Lt.-Col. J. G. Weir, R.F.C., has the advantage of working with one whom he has known all his life, so that there cannot well be any misunderstandings between the Technical Department and the Production chief.

Moreover, under the scheme of reorganisation for the Production branch, technical officers are likely to find themselves on a better financial and Service footing than they were when their claims to recognition were bandied about fruitlessly between the War Office and the Treasury, and this alone should make for greater efficiency. So long as the Flying Services have a full say in matters of design and are not overwhelmed by the keenness of the Ministry of Munitions for mere quantity production, all will be well, and one has every confidence in Sir William Weir's ability to keep the balance justly.

Sir John Hunter, as Administrator of Works and Buildings, has also a big task in achieving efficiency, order and economy. His experience as Director of Factory Construction, and as Director of Iron and Steel Production under the Ministry of Munitions, gives one belief in his suitability for the post.

### JUST RECOGNITION.

Lieut.-General Sir David Henderson's appointment as an additional member of the Air Council, and as Vice-President, is a proper recognition of the years which he has devoted to aeronautics. Many of us have disagreed cordially with his policy and with his principles, but he has done his duty as he saw it.

His abilities in many directions will be of high value to the Air Council, and his powerful influence in political circles can be of great use to the Flying Services.

Major Baird still remains the representative of the Flying Services in the House of Commons, and doubtless this is also a very fitting arrangement.

### THE FUTURE.

Altogether, if the elected representatives of the people insist on having a hermaphrodite, amphibious Air Force, we have, at any rate, the satisfaction of knowing that the show is going to be run as well as is humanly possible by the officers and officials who are best qualified to run it. Nevertheless, one must express once more the opinion that the whole arrangement is a mistake. It would have been far better to have had a third Air Service, and to have left the R.N.A.S. to the Navy and the R.F.C. to the Army, with a Supply Board to see fair play in matériel.

The curious thing about the whole affair is that the Admiralty, which formerly scorned the R.N.A.S., now seems loth to part with it. Meanwhile, the majority of the personnel of the R.N.A.S., as the result of the treatment it received from the Navy in its early days, is exceedingly anxious to get out of the Navy and into the Air Force.

On the other hand, practically every soul in the R.F.C. is against the combination Air Force. Officers and men alike are proud to belong to the British Army, with its magnificent tradition, and its historic glory. They have no desire to be pushed off into an aerial wilderness without any particular Promised Land, in the shape of a fixed establishment, in sight. So the personnel of the R.F.C. would rather remain in the Army. Wherein one cordially agrees with them.

### A POSSIBLE POLICY.

One can only hope, therefore, that the Air Council will have the wisdom to meet all these prejudices half-way. This can be done by splitting the Air Force definitely into three sections, sea, land, and air—as distinct as, but no more distinct than, foot, horse, and guns. Then the R.N.A.S.—or such of it as likes the Navy—can remain the R.N.A.S. in its present uniform. The R.F.C. can remain to all intents and purposes part of the Army, with its present name and uniform and the proud tradition which it has already acquired. And the Imperial Air Force can go and be air pirates in any uniform it pleases.

There is nothing to prevent such a scheme from working under the Air Council just as well as the different branches of the Army work under the Army Council. And it will give the most satisfaction to the people who are most numerous, even if they count least for politicians, the people who do the flying.—C. G. G.



## THE CURIOSITY SHOP.

It was announced in all London papers on Jan. 2nd that the British Museum had been taken over by the Government. The London News Agency was apparently responsible for the statement that within a few days a portion of it will be used as the offices of the Air Council.

The authorities, it is stated, have chosen the British Museum to house the staff of the Council with some reluctance, but were unable to find any other suitable building.

Naturally there has been a howl of indignation in the Press at the vandalism of the Government, a howl which could not have been increased if a Hun had dropped a bomb into the sacred edifice. It seems only fair therefore to find a few reasons in defence of the Air Council's action.

Imprimis, as the Nation's chief curiosity shop, it seems fitting that such a curiosity as the Air Council, combining as it will the governance of earth, sea, and air, should be housed there.

Secondly, considering that the Museum contains relics of all the Pharaohs, Cæsars, Monarchs, Plutarchs, and other arches in the world's history, it seems a fitting home for our brand-new Aerarch, Lord Rothermere.

Thirdly, as the Air Council seems to be so deeply concerned for the uniform of the new Air Force, it will be handier for it to go to the Museum than for the Museum to be brought to it—in these days of transport shortage—when suggestions are needed in this great task. All the uniforms of Nineveh, Babylon, Egypt, Assyria, Persia, Greece, Rome, and the Italian Renaissance States, will be immediately available for inspection by, and inspiration to, the Air Council.

Fourthly, the presence of the Air Council will be the best possible guarantee of the safety of the Museum's treasures. It is now fairly well recognised that any Hun aviator who damages a British Government Department will be shot on returning to Germany, for it is considered that the destruction of any Department might, by abolishing obstructive procedure, facilitate the task of those who are trying to win the war, and the Germans are said to approve highly of our Departmental systems. Therefore, the Museum is likely to be fairly safe against bombs while it is the seat of a Department.

On the whole, therefore, one pleads that the taking over of the Museum by the Air Council is justifiable, and even a national service.

Still, in view of the popular outcry, it would be a graceful act if the King were to offer Buckingham Palace instead.

## ICHABOD.

To-day the typist and the flapper keep  
The Halls where Raméses doth slumber deep.  
The "Hetman" of Department—*that* wild ass!—  
Ramps round his tomb. 'Twill sure disturb his sleep

C. G. G.

## THE AIR FORCE MEDICAL SERVICE.

The following notes, published in the "British Medical Journal," are worthy of attention by those in authority:—

"The Order contains no reference to an Air Medical Service, but it is clear that such a service must at once be established, and it is sincerely to be hoped that the vacant seat on the Air Council may be filled by its Director-General. Part of the work of the Air Medical Service will be of the ordinary kind which falls to be performed by every military medical service, but much of it will be conditioned by the peculiar duties of an air force.

"A man who aspires to fly must be submitted to very strict physical examination by the Air Service medical officer before he is sent to be trained; he must be very carefully watched during his training to discover any latent weakness, and after he has been passed as a flier constant supervision must be kept over the state of his general health, and especially over the condition of his nervous system, to ensure that the perfect adjustment between senses, brain, and muscles, which he must have possessed when he passed the flying tests, is maintained. Many accidents can be traced to a pilot going up when he was not thoroughly fit.

"Civil practitioners have hitherto had nothing to do with air problems, and physiologists very little. It is therefore incumbent on the Secretary of State for the Air to institute and encourage research into the special physiological and medical problems awaiting solution for the greater efficiency of his service and the saving of lives and equipment."

[So far from encouragement being given to Service doctors to study aeronautical pathology, the authorities have rather discouraged such research. The Naval doctor, who did such excellent pioneer work at Eastchurch from the earliest days of Naval flying and made a special study of aviation accidents and of the physical and psychological effects of flying, was sent to take charge of sailormen at sea not very long ago. Specialists

who joined the R.N.A.S. early in the war are not used to proper advantage, and are subordinated to ordinary Naval farriers, so that their particular skill is wasted. R.A.M.C. doctors, if a trifle better treated, have not been fully encouraged to the best advantage and have been compelled to stick to rules and regulations intended for a purely ground army. Probably the most important work has been done by civilian doctors working voluntarily at the R.F.C. Hospitals founded by Dr. Swann in Bryanston Square. One hopes therefore that ultimately the Air Ministry will co-ordinate the work of all these groups and will use the splendid material which it has at hand in the best possible way.—C. G. G.]

## CAPTAIN VON RICHTHOFEN'S BOOK.

An application was before the Patents Court on Jan. 3rd for permission to publish in this country an English translation of the German book on flying, "Der Rote Kampfflieger," by Manfred, Freiherr von Richthofen, the German aviator, who is again flying on the Western front. There were two applicants, Messrs. Cassell and Co., the publishers, and the Aeroplane and General Publishing Co., Ltd.

Mr. Flower, representing Messrs. Cassell, said that the book contained what purported to be an authentic account of Richthofen's flights and an account of the manner in which Capt. Ball, the young English aviator, was brought down. Messrs. Cassell received a copy of the book from Holland, and were of opinion that it would create great interest if published here.

Messrs. Cassell's representative added that they proposed to publish the book as a serial in one of their publications, and then as a book with illustrations.

Mr. Salmon, on behalf of the Aeroplane and General Publishing Company, Ltd., stated that information of the book came from Stockholm, through a man who said that he had bought the English and Swedish translation rights, and who offered the English rights. The company sent the book to the Air Board, who said that they saw no objection to its publication, and it was thought that it would be of interest to the Flying Service.

After some discussion, the representatives of the applicants expressed the view that some arrangement could be come to in regard to combined publication.

The Controller said that they would recommend that the licence be given to one or other of the applicants, who must notify any arrangement that they might arrive at. He was satisfied that the work was a serious work, and that it was of general public interest.

## COMBING THE GERMAN ARMY.

The special correspondent of the "Morning Post," writing from the British front in France on Jan. 2nd, records the process of "combing out" which is now taking place in the German Army to swell the personnel of the Flying Corps.

He says: "The stress laid on the deficiency in the Flying Corps is significant. Prisoners have said that the German air service suffered very severely during the past year, the wastage in machines and expert pilots being especially severe in the Flanders and Laon areas.

"It has become increasingly difficult to get an adequate supply of personnel and machines of the newer type, which cannot be replaced quickly. Apparently there is an ample number of recruits for bombing work, but good scouting pilots are rare.

"Fighting units have been reduced in the number of machines, and the personnel reduced in order to provide additional instructors for the new schools of instruction in Germany.

"There have been a number of other German official utterances intended to impress the Army with the importance of this year's air offensive. The stories of the vast preparations made by the United States, although sneered at in the German Press, are undoubtedly accepted at their true value by professional soldiers.

"The recent entry of America into the war," says a German official document issued to the troops at the beginning of the autumn, "compels the Higher Command to form considerable numbers of new aircraft units. Divisions and units will forward to the proper authorities all requests of officers and men for transfer to the Flying Corps."

"Another order emphasises the importance of a wide response to this invitation, and points out that the success of the campaign of 1918 may depend on Germany's supremacy in the air.

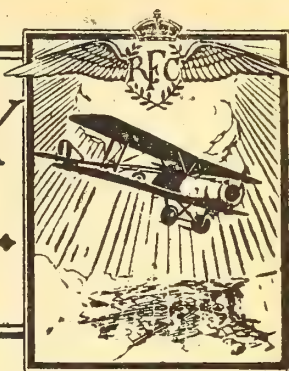
"There has been a good deal of air fighting during the past fortnight, and our flying men have found their opponents very enterprising in spite of the unfavourable conditions. A number of spirited combats took place during the last week of the old year over the Cambrai defences, where the German aviators tried repeatedly to search our back areas and to photograph extensively as well as to bomb troops and munition stores.

"The snow gives exceptional opportunities for 'spotting' batteries, and the dead white background of the battlefield frequently yields secrets which are well hidden when the armies are sitting in the mud."





# NAVAL *and* MILITARY • AERONAUTICS •



## FROM THE "LONDON GAZETTE."

[NOTE.—R.F.C. Honours, Decorations, and Special Promotions published during the past week will be found under their respective headings in the R.F.C. Honours List which is to be found at the end of the Naval and Military Section.—Ed.]

ADMIRALTY, Dec. 24th.

JAN. 1st.—R.N.A.S.—To be Obsr. Lt.:—F. J. Hooper (Jan. 1st).

WAR OFFICE, Jan. 1st.

**REGULAR FORCES.—STAFF.**—The following appointments are made:—A.G.'s and Q.M.G.'s Staff.—D.A.A.G.—Capt. (temp. Maj.) C. S. McNab, Cam'n Highrs., from an Asst. Comdt. (graded as a Park Comdr.), R.F.C. Schools of Mil. Aeronautics, and to relinquish his temp. rank (Nov. 22nd, 1917).

**ESTABLISHMENTS.—R.F.C.—MIL. WING.**—Staff Offr., 2nd Cl.—(Graded as Brig.-Maj.)—Capt. H. N. Walker, M.C., Welsh R. (Nov. 19th, 1917).

Staff Offr., 3rd Cl.—(Graded as a Staff Capt.)—Lt. (temp. Capt.) H. French, W. York R., Spec. Res., from a Staff Capt., and to retain his temp. rank while so empld. (Dec. 2nd, 1917).

Flt. Comdrs.—Temp. Lt. J. C. O. Dickson, Gen. List, from a Flyg. Offr., and to be temp. Capt. while so empld. (Dec. 1st, 1917); Capt. J. C. L. Barnett, Oxf. and Bucks L.I., T.F., from a Flg. Offr. (Dec. 12th, 1917). From Flyg. Offrs., and to be temp. Cpts. while so empld.:—Lt. R. F. S. Manduit, D. Gds., Sec. Lt. (temp. Lt.) J. S. Smith, N. Staff. R., Spec. Res.

Asst. Instrs. in Gunnery.—Graded as an Equipment Offr., 2nd Cl.—Temp. Lt. W. L. Hill, Gen. List, from an Asst. Instr. in Gunnery (graded as an Equipment Offr., 3rd Cl.) (Dec. 1st, 1917). Graded as an Equipment Offr., 3rd Cl.—Temp. Lt. W. F. Baker, Glouc. R., and to be transfd. to R.F.C., Gen. List (Oct. 1st, 1917).

Balloon Co. Comdrs.—(Graded as Flt. Comdrs.)—From Balloon Comdrs. (graded as Balloon Offrs.), and to be temp. Cpts. whilst so empld.:—Temp. Sec. Lt. (temp. Lt.) W. G. Dreschfeld, Gen. List; Lt. W. F. N. Forrest, R.F.A., Spec. Res. (Dec. 4th, 1917).

Adjnt.—Qrmr. and Hon. Capt. S. H. Cleall, R. Ir. F., from an Equipment Offr., 3rd Cl. (Sept. 20th, 1917).

Equipment Offr., 1st Cl.—Lt. J. Brown, Spec. Res., from the 2nd Cl., and to be temp. Capt. whilst so empld. (Sept. 15th, 1916).

Schools of Instrn., Schools of Mil. Aeronautics.—The appts. of Sec. Lt. (temp. Capt.) S. McClure, N. Staff. R., Spec. Res., should be under the above schools, and not as in the "Gazette" of Aug. 20th, 1917.

Asst. Instr.—(Graded as an Equipment Offr., 2nd Cl.)—The appt. of Lt. G. Curgenvin, Yeo., T.F., notified in the "Gazette" of Nov. 27th, 1917, is antedated to July 24th, 1917.

Equipment Offrs. School of Instrn.—Asst. Instr.—(Graded as an Equipment Offr., 2nd Cl.)—Lt. F. S. Smith, Spec. Res., from an Asst. Instr. (graded as an Equipment Offr., 2nd Cl.), Schools of Mil. Aeronautics (Oct. 27th, 1917).

WAR OFFICE, Jan. 2nd.

**REGULAR FORCES.—GEN. STAFF.—G.S.O., 3rd Grade.**—Capt. J. G. Overbury, Midd'x R., T.F., from a Staff Officer, 3rd Cl., R.F.C., from March 14th to June 20th, 1917.

**ATTACHED TO HDQR. UNITS.**—Staff Cpts.—Temp. Sec. Lt. (temp. Lt.) J. McG. Glen, R. Scots, from a Flying Officer (Obsr.) and to be temp. Capt. whilst so empld., Nov. 27th, 1917.

**ESTABLISHMENTS.—R.F.C.—MIL. WING.**—Staff Officer, 2nd Cl. (Graded as a Brig.-Maj.)—Capt. O. T. Boyd, M.C., Ind. Army, Dec. 2nd, 1917.

Sqdn. Comdr.—Lt. (temp. Capt.) R. J. Lowcock, D.S.O., M.C., Notts and Derby R., from a Flt. Comdr., and to be temp. Maj. whilst so empld., Nov. 16th, 1917.

Flt. Comdrs.—From Flying Officers, and to be temp. Capt. whilst so empld.:—Lt. F. H. E. Reeve, North'd Fus., T.F.; Lt. T. J. C. Martyn, Lond. R., T.F., Dec. 10th, 1917. Temp. Sec. Lt. (temp. Lt.) H. T. O. Windsor, Gen. List, Dec. 11th, 1917.

Temp. Capt. W. B. Tisdall, Gen. List, Dec. 14th, 1917. Sec. Lt. (temp. Lt.) A. M. Swyny, R. Ir. R., Spec. Res., and to be temp. Capt. whilst so empld., Dec. 17th, 1917.

Balloon Co. Comdr.—(Graded as a Flt. Comdr.)—Lt. H. A. Laycock, Durh. L.I., T.F., from a Balloon Comdr. (graded as a Balloon Officer), and to be temp. Capt. whilst so empld., Dec. 10th, 1917.

Adjnt.—Capt. G. B. McClure, R. Highrs., from Training Res., and to be secd., Dec. 1st, 1917.

Equipt. Officers, 1st Cl.—From the 2nd Cl., and to be temp. Cpts. whilst so empld.:—Lt. G. E. W. Broade, R.E., Spec. Res., Oct. 19th, 1917. Sec. Lt. (temp. Lt.) W. H. Clover, Oct. 23rd, 1917. Lt. T. W. Tattersall, Spec. Res., Nov. 1st, 1917. Temp. Capt. (temp. Maj.) E. A. Goodwin, Gen. List, reverts (at his own request) from a special appt. (graded as a Park Comdr.) and relinquishes the appt. of temp. Maj., Dec. 10th, 1917, seny. from Aug. 1st, 1916.

**SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—MIL. WING.**—The relinquishment of his commn. by Lt. (temp. Capt.) A. M. Low, notified in the "Gazette" of Oct. 19th, 1917, is cancelled. Lt. (temp. Capt.) A. M. Low to be empld. with Admiralty, Oct. 2nd, 1917.

WAR OFFICE, Jan. 3rd.

**REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—MIL. WING.**—Wing Comdrs.—Capt. (temp. Maj.) E. L. Gossage, M.C., R.A., from a Sqdn. Comdr., and to be temp. Lt.-Col. whilst so empld., Dec. 5th, 1917. The appt. of Capt. (temp. Maj.) R. R. Smith-Barry, Spec. Res., notified in the "Gazette" of Sept. 7th, 1917, is cancelled.

Special Appt.—(Graded as a Sqdn. Comdr.)—Capt. D. E. Stodart, Spec. Res., from a Flt. Comdr., and to be temp. Maj. whilst so empld., Dec. 12th, 1917.

Balloon Co. Comdr.—(Graded as a Flt. Comdr.)—Capt. H. A. Page, S. Staff. R., T.F., from a Balloon Comdr. (graded as a Balloon Officer), Dec. 4th, 1917.

**SCHOOLS OF INSTRUCTION.—SCHOOLS OF MIL. AERONAUTICS.**—Asst. Instr.—(Graded as a Park Comdr.)—Temp. Maj. W. H. Barff, D.S.O., Ches. R., and to be transfd. to R.F.C., Gen. List, Sept. 8th, 1917.

Instr.—(Graded as an Equipt. Officer, 1st Cl.)—Lt. R. O. C. Bush, R. Dub. Fus., from an Asst. Instr. (graded as an Equipt. Officer, 2nd Cl.), and to be temp. Capt. whilst so empld., Sept. 5th, 1917.

**SCHOOLS OF SPECIAL FLYING.**—Comdt.—(Graded as a Wing Comdr.)—Capt. (temp. Maj.) R. R. Smith-Barry, Spec. Res., a Sqdn. Comdr., and to be temp. Lt.-Col. whilst so empld., Aug. 23rd, 1917.

WHITEHALL, Jan. 3rd.

## THE AIR COUNCIL.

By Warrants under the Royal Sign Manual the King has been pleased to make the following appointments to the Air Council which has been established this day:—

Maj.-Gen. Sir Hugh Montague Trenchard, K.C.B., D.S.O., to be Chief of the Air Staff.

Rear-Admiral Mark Edward Frederic Kerr, C.B., to be Deputy Chief of the Air Staff.

Capt. (Comm., 1st Class) Godfrey Marshall Paine, C.B., M.V.O., to be Master General of Personnel.

Maj.-Gen. William Sefton Brancker, to be Controller General of Equipment.

WAR OFFICE, Jan. 4th.

**REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—MIL. WING.**—Sqdn. Comdr.—The appt. of Sec. Lt. (temp. Capt.) J. C. Callaghan, M.C., R. Muns. Fus., notified in "Gazette" of Nov. 30th, 1917, is cancelled.

Flt. Comdr.—Temp. Sec. Lt. B. F. B. Carter, Gen. List, from a Flying Officer, and to be temp. Capt. whilst so empld., Dec. 16th, 1917.

Adjnt.—Lt. R. B. Waite, Yeo., T.F., to be secd., and to be temp. Capt. (with pay and allowances of Lt.) whilst so empld., Sept. 15th, 1917.



**SCHOOLS OF INSTRUCTION.—SCHOOLS OF AERIAL FIGHTING.—**  
Comdt.—(Graded as a Sqdn. Comdr.).—Sec. Lt. (temp. Capt.)  
J. C. Callaghan, M.C., R. Muns. Fus., a Flt. Comdr., to be  
secd., and to be temp. Maj. whilst so empld., Oct. 21st, 1917.  
Gen. List.—Scrij. L. S. Collins, from R.F.C., to be temp.  
Sec. Lt., Dec. 17th, 1917.

#### THE PRIVY COUNCIL.

At the Court at Buckingham Palace, Jan. 2nd, 1918.—Present,  
the King's Most Excellent Majesty in Council.

This day the Right Honourable Harold Sidney, Baron Rothermere, was, by his Majesty's Command, sworn one of his Majesty's Principal Secretaries of State.

ALMERIC FITZROY.

WAR OFFICE, Jan. 5th.

**REGULAR FORCES—ESTABLISHMENTS.—R.F.C.—MIL. WING.**  
—Staff Officer, 3rd Cl. (graded as a Staff Capt.).—Lt. (temp. Capt.) F. G. Stammers, R. Suss. R., from an Adj., and to retain his temp. rank whilst so empld., Oct. 6th, 1917.

Special Appt. (graded as a Sqdn. Comdr.).—Lt. (temp. Capt.)  
E. L. Millar, Spec. Res., from a Flt. Comdr., and to be temp. Maj. whilst so empld., Nov. 24th, 1917.

Flt. Comdrs.—From Flying Officers:—Lt. R. S. P. Boby, Lan. Fus., T.F., and to be temp. Capt. whilst so empld., Dec. 7th, 1917; Capt. T. F. W. Thompson, Welsh R., Spec. Res.; Temp. Sec. Lt. T. B. Jones, Gen. List, and to be temp. Capt. whilst so empld., Dec. 17th, 1917.

Adjts.—Capt. F. Wilkinson, S. Staff. R., T.F., from a Balloon Officer, vice Lt. (temp. Capt.) F. G. Stammers, R. Suss. R.; Temp. Sec. Lt. (temp. Lt.) E. B. A. Rayner, Gen. List, and to be temp. Capt. (with pay and allowance as Lt.) whilst so empld., Oct. 6th, 1917; Capt. W. W. London, Lond. R., T.F., and to be secd., vice Capt. R. B. C. M. T. de Poix, Norf. R., T.F., Oct. 13th, 1917.

Equipt. Officers.—1st Cl.—Lt. H. H. Thomas, R.F.A., T.F., from the 2nd Cl., and to be temp. Capt. whilst so empld., Nov. 7th, 1917.

**SCHOOLS OF INSTRN.—SCHOOLS OF MIL. AERONAUTICS.—ASST. COMDT.**—(Graded as a Park Comdr.).—Temp. Maj. A. C. E. S. Bowlby, Gen. List, a Flying Officer, Nov. 17th, 1917.

**SCHOOL OF TECHNICAL TRAINING.—COMDT.**—(Graded as a Depot Comdr.).—Lt.-Col. J. Attenborough, C.M.G., Lond. R., T.F., Dec. 7th, 1917.

Gen. List.—Capt. E. C. Carver, D.S.O., ret., R.N., to be temp. Maj., Jan. 5th.

WAR OFFICE, Jan. 7th.

**REGULAR FORCES—ESTABLISHMENTS.—R.F.C.—MIL. WING.**  
—Flt. Comdr.—Temp. Lt. K. R. Kirkman, Gen. List, from a Flying Officer and to be temp. Capt. whilst so empld., Dec. 18th, 1917.

Depot Comdr.—Quar. and Hon Lt. (temp. Maj.) A. H. Measures, from a Park Comdr., and to be temp. Lt.-Col. whilst so empld., Oct. 17th, 1917.

Park Comdr.—Lt. (temp. Capt.) N. M. Halcombe, R.E., T.F., from an Equipt. Officer, 1st Cl., and to be temp. Maj. whilst so empld., Nov. 24th, 1917.

Equipt. Officers, 1st Cl.—Sec. Lt. (temp. Lt.) R. Clelland, Spec. Res., from the 2nd Cl., and to be temp. Capt. whilst so empld., Dec. 1st, 1917.

**OVERSEAS CONTINGENTS.—CANADA.—**Can. A.S.C.—Temp. Lt. D. Carruthers to be temp. Capt., and to remain secd. to R.F.C., Dec. 16th, 1916.

\* \* \*

The King has been graciously pleased to give orders for the following promotions in and appointments to the Most Excellent Order of the British Empire (dated Jan. 1st) for services in connection with the war:—

#### Knights Commanders (K.B.E.).

FRANK BAILLIE, Esq.

Director of National Aeroplane Factory, Toronto.

Lt.-Col. HENRY FOWLER, C.B.E.

Chief mechanical engineer to the Midland Railway; Superintendent of the Royal Aircraft Factory, Farnborough.

JAMES McKECHNIE, Esq.

Managing Director of Messrs. Vickers, Ltd., Barrow.

#### Dame Commander (D.B.E.).

Mrs. ETHEL LOCKE-KING.

Vice-President of North Surrey Division and Assistant County Director, Surrey, British Red Cross and Order of St. John of Jerusalem.

#### Commanders (C.B.E.).

RICHARD WILLIAM ALLEN, Esq., J.P.

Director and Manager of Messrs. W. H. Allen, Son and Company, Bedford.

Maj. THOMAS GERARD HETTINGERINGTON.

Services in connection with the origination of Tanks.

Lt.-Comdr. BASIL OLIVER JENKINS, R.N.V.R.

Member in charge of Aviation, British War Mission, United States of America.

Wing Capt. EDWARD ALEXANDER DIMSDALE MASTERMAN, R.N.A.S.

ARTHUR JOHN RELTON, Esq.

Member of the Aircraft Insurance Committee.

JOHN DAVENPORT SIDDELEY, Esq.

Managing Director of the Siddeley-Deasy Co., Ltd.

THOMAS OCTAVE MURDOCH SOPWITH, Esq.

Chairman and Test and Experimental Manager of Sopwith Aviation Co., Ltd.

#### Officers (O.B.E.).

GEORGE STEPHEN BAKER, Esq.

Superintendent of the William Froude National Tank, National Physical Laboratory.

Lt.-Col. RICHARD BELL-IRVING.

Instructor, Royal Flying Corps.

ALGERNON EDWARD BERRIMAN, Esq.

Chief Engineer, Daimler Co., Ltd.

Flt. Comdr. (Actg. Wing Comdr.) FRANK ARTHUR BROCK, R.N.A.S.

Sqdn. Comdr. HENRY RICHARD BUSTEED, R.N.A.S.

Sqdn. Comdr. ROBERT ARTHUR CHALMERS, R.N.A.S.

Maj. HENRY EDWARD CHANEY.

Headquarters Training Division, Royal Flying Corps.

GEORGE BERTRAM COCKBURN, Esq.

Inspector of Aeroplanes, Aeronautical Inspection Directorate.

Maj. FRANCIS SAMUEL CRESWELL.

Park Commander, Royal Flying Corps.

Maj. HENRY STUART EBLEN.

Deputy Assistant Adjutant-General, Royal Flying Corps.

BASIL PRESTON EVERETT, Esq.

Head of Drawing Office, Air Board, Technical Department.

Lt. DONALD McNEILL GREIG.

Supply Officer in Aeroplane Supply Branch, Air Board.

Maj. HAROLD GRINSTED.

Chief Engineer, Royal Aircraft Factory.

Maj. CHARLES JARROTT.

Inspector of Mechanical Transport, Royal Flying Corps.

CHRISTOPHER NEWMAN KNIGHT, Esq.

Section Director, Contracts Branch, Air Board.

JOHN JAMES McKEOWN, Esq.

Manager, Vickers, Ltd., Barrow.

Wing Comdr. ALEC OGILVIE, R.N.A.S.

Head of Aeroplane Design Section, Air Board Technical Department.

Sqdn. Comdr. CHARLES-FREDERICK POLLOCK, R.N.A.S.

ALLIOTT VERDON ROE, Esq.

Capt. TANNER MONTAGU ROGERS.

Production Officer, Aeroplane Supply Branch, Coventry District.

FREDERICK HENRY ROYCE, Esq.

Director and Chief Engineer, Rolls-Royce, Ltd.

#### Members (M.B.E.).

THOMAS EASTON ALLAN, Esq.

Messrs. Robey and Co., Ltd.

SYDNEY WATSON ATTWELL, Esq.

Asst., National Physical Laboratory

Capt. WILLIAM EDGAR AYLWIN, R.F.C.

Lt.-Comdr. THOMAS BARWELL BARRINGTON, R.N.V.R.

Design Section, Air Board, Technical Dept.

Capt. PERCY BISHOP.

Asst. Engineer engaged on design of aeroplanes at Royal Aircraft Factory.

ARTHUR WILLIAM BURGESS, Esq.

In Charge of Aeronautical Supply Dept. Registry, Air Board.

Maj. CHARLES DUNCAN MILES CAMPBELL, R.F.C.

MISS MARGARET CHALMERS.

Administrative Asst., Materials and Accessories Branch, Air Board.

BERTRAM GEORGE COOPER, Esq.

Head of Sub-Section of Air Board Technical Dept.

BERNARD PHINEAS DUDGING, Esq.

Asst. Nat. Physical Laboratory.

Capt. WILLIAM SCOTT FARRER.

In Charge of Aero-Dynamics at Royal Aircraft Factory.

MISS HELEN GOODYEAR.

Admin. Asst., Contracts Branch, Air Board.

Lt.-Comdr. CHARLES FREWEN JENKINS, R.N.V.R.

Air Board, Technical Dept.

Flt. Lt. LEON JOSEPH KILLMAVER, R.N.

Production Officer, Seaplanes Branch, Air Board.

ALFRED TABOIS LARTER.

Aeronautics Contracts, Contracts Dept., Min. of Munitions.

Capt. THOMAS LYONS.

Dep. Asst. Director of Aircraft Equipment, Air Board.

WALTER ALFRED MEDROW, Esq.

Air Dept., Admiralty.

Maj. SIDNEY ERNEST PARKER.

Instr., R.F.C.

ALFRED JOHN SUTTON PIPPARD, Esq.

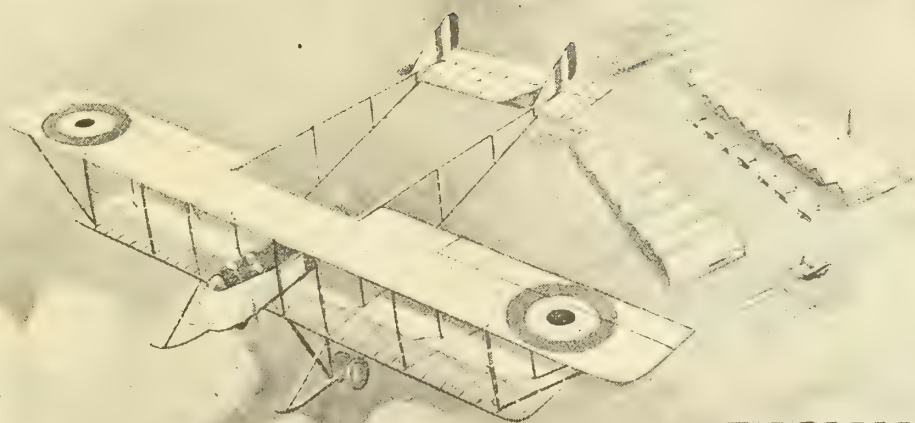
Head of Sub-Section in Technical Dept. of Air Board.

(Continued on page 236a.)



# WHITEHEAD

## AIRCRAFT



GEOFFREY WATSON 1917

RICHMOND  
SURREY



# **AIRCRAFT MANUFACTURING COMPANY———LIMITED**

**Contractors to  
War Office and Admiralty**

**London Office**

**27, BUCKINGHAM GATE, S.W.1.**

**Offices & Works**

**HENDON, N.W.9.**





KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

# **VICKERS LIMITED**

Aviation Department,  
Imperial Court, Basil Street,  
KNIGHTSBRIDGE, S.W.

## **Aircraft**

Telephone :  
No. 6810 Kensington (2 lines)  
Telegraphic Address :  
Vickerlyta, Knights, London

Contractors to the  
**WAR OFFICE and  
ADMIRALTY**



# AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER

## The British Aircraft Industry.

(SECOND SERIES.)

BY R. P. HEARNE.

### II.—THE PALMER TYRE, LTD.

It shall be my endeavour to make this series of articles as varied in subject as possible, in order that we may bring out the wonderful scope of the Aircraft Industry, and show its numerous ramifications. Without some explanation it might seem odd that tyres should be regarded as a branch of the industry, and yet as I shall demonstrate presently the aeroplane tyre is a very important and highly specialised item.

Tyres are the feet of the mechanical birds, and when the weight of these birds runs into tons, and when this mass has to be carried by the tyres at high speed over any kind of surface during starting and landing operations, it is evident that the aeroplane tyre must be a remarkably staunch article.

Those of us who have followed the evolution of the pneumatic tyre from the first Dunlop bicycle tyre and the first Michelin motor tyre will take all the more interest in the application of the pneumatic wheel to aeroplanes. And it is fitting that the new development should owe much of its success to an old-time cyclist, and a man who had made his mark in the tyre world long before the aeroplane became practicable.

#### THE GENESIS OF THE AERO TYRE.

To Mr. E. J. Mitchell, managing director of the Palmer Tyre Company, belongs much of the credit for the Palmer aero tyres and wheels, though Mr. Mitchell will have it that it is the inventor of the Palmer Cord Tyre, Mr. Sloper, whom our Flying Services must thank for the excellence of their landing wheels.

The Palmer Cord Tyre had made its mark in motoring many years ago, the special method of building up the cover from transversely laid and rubberised cords giving the tyre immense strength and durability, whilst resilience and absorption of vibration are also very marked. Nevertheless, there is a big gap between the motor tyre and the aeroplane tyre, and had it not been that Mr. Mitchell took a very active interest in aviation as long ago as the London to Manchester flight of blessed memory we should not have such good tyres to-day on aeroplanes.

A discussion with Mr. Grahame-White on that eventful occasion encouraged Mr. Mitchell and the Palmer tyre inventor to make a special study of aeroplane landing wheels. At that time the motor world was much exercised over the big tyre problem. It was the theory of Mr. Mitchell and other far-seeing people that tyres should be made larger, thus giving better cushioning

effect, and adding to, rather than detracting from, the speed. The first aeroplane tyres were more like glorified bicycle tyres, and when the Palmer Company took up aerial work it was sought to apply the big tyre principle here also.

#### CONVINCING THE INDUSTRY.

It was not an easy task, for aeronautical engineers had various objections to urge, as, for example, the increased weight and the extra head resistance entailed. But the big tyre won, and to this circumstance many a pilot to-day owes his life. If every landing could be made on a billiard-table surface, the matter of tyre size would not be so important, but we have only to take the case of a wounded pilot, or of the pilot of a damaged machine, making a forced landing in the war area to realise how much depends on a tyre which will give the maximum of cushioning effect, and which will withstand rough usage.

#### THE WILY HUN.

That the Germans know a good thing when they see it is proved by the fact that whenever a British aeroplane is brought down by the enemy and captured in such a state that the tyres can be used, the wily Hun proceeds to appropriate those tyres to his own use. And as so many Palmers are used by the British Flying Services it is not unusual for Palmer Aero Tyres to serve this country for a while, and thereafter to be compelled to serve the Hun. This fondness for Palmers is not entirely due to shortness of rubber in Germany, but is evidently due to an appreciation of the Palmer Tyre itself, and its long wearing qualities.

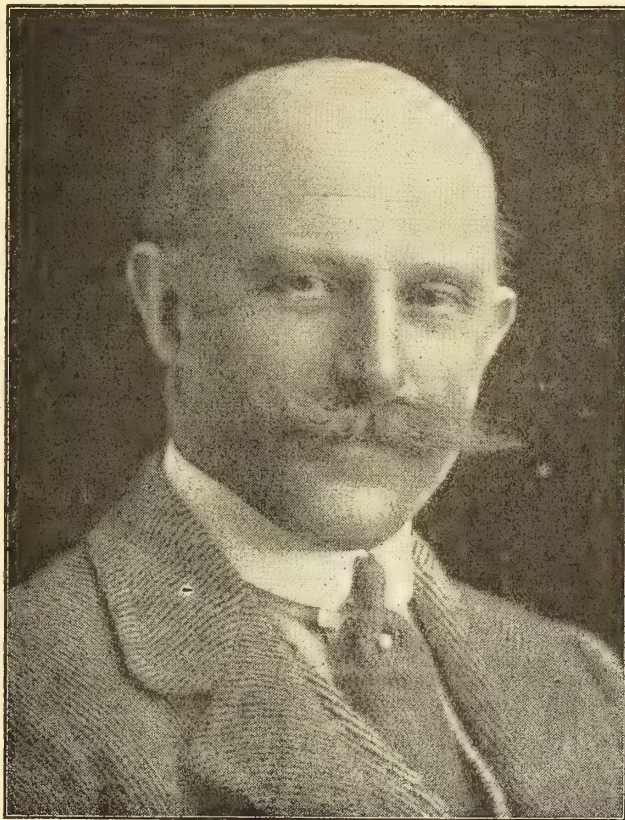
#### RUBBER SHORTAGE.

That the Germans are severely handicapped by the shortage of rubber is very evident, and if our High Authorities had only had a

little technical knowledge about motoring and aviation they would have seen from the first how vital it was to shut out rubber from Germany at all costs.

The rubber shortage must be very acute now, and undoubtedly it is having marked effect on the German aerial programme. There is not enough rubber to make good tyres of ample size, and the result is that the German losses in pilots and machines through bad smashes must be abnormal.

To eke out the rubber supply the quality of the article must be deteriorated, and if we can only make sure that there is no leakage of rubber into Germany we can, in this matter of aeroplane



Mr. E. J. Mitchell.



tyres, make it very awkward for the enemy when he seeks to turn out great quantities of machines for the spring campaign.

#### PALMER QUALITY.

To produce first-class aerial tyres like the Palmer one must have generous supplies of the very finest rubber and fabric. There is no really effective substitute for either, and the rubber in particular must be of the very best quality. The Palmer tyre is especially rich in rubber, for in addition to the tread each single thread and transverse cord of the foundation has its rubber coating.

Some idea of the development which has taken place in this new industry may be obtained from the fact that nearly fifty different types of landing wheels and tyres are listed by The Palmer Tyre, Limited. The smallest tyre has a cross diameter of 60 millimetres, whilst the largest is no less than 200 millimetres, or eight inches in diameter. This figure may by no means mark the limit.

#### A FINE COMBINATION.

The Palmer aero tyre and wheel is a special production right through, and Mr. Mitchell gave me an insight into the various features which bring about its success. Outwardly there seems no difference between the aero and the motor tyre; but in point of fact the difference is very considerable.

Naturally I must not detail the particular features, and I think I am safe in saying that the war will be over before the Germans will be able to make a tyre as good. Many years of patient study and experiment have gone to build up the Palmer aero tyre, and

high quality is maintained by the most exacting tests. In the trial to destruction of these tyres and wheels many amazing results have been obtained; and it must be a great satisfaction to our pilots that their machines are fitted with such staunch landing gear.

#### PERSONAL INTEREST.

Mr. Mitchell is very keenly interested in aviation, and he looks forward to the peace-time uses of aircraft with great eagerness. I tried to shake his faith by suggesting that the big machines of the future will dispense with landing wheels and tyres, but as an old cyclist and motorist I fear I did not push the theory with sufficient vigour, for we both knew how invaluable the pneumatic tyre is in absorbing those shocks incidental to locomotion.

Concentrating so much attention on the aeroplane landing-gear problem the Palmer Tyre experts are looking ahead, needless to say, and we may expect from them not a few interesting developments, upon which at present it would be premature to touch.

But it is matter for great satisfaction that we had in this country a tyre firm which long before the war had prepared for the specialised production of landing gear, and a firm, too, which, when the call for big supplies came, was able to meet it. The fashion with many pessimists is to assert that we have no enterprise, and that we have to go to Germany for nearly everything. But here is a striking example of an essentially British firm taking a long lead in its own particular line of business, at a time when anything pertaining to aircraft was hardly considered worth touching, and, in spite of all opposition, holding that lead.

## Concerning Wire Ropes.

BY J. AND W. KER WILSON.

At the inquiry in 1916 in the case of Second-Lieutenant J. R. Chamberlin, who was killed owing to his machine breaking in the air, the finding of the investigators was that the cable broke through sudden stress. This finding was subsequently combated by Sir Charles Parsons, who declared that there was no evidence to indicate that the cable broke through any ordinary air strain.

The purpose of the writers is to endeavour to contribute rather more than lay experience in this very important matter of Steel Wire Cables, and their particular application to aircraft.

There can be no doubt that Flexible Cable will, eventually, as the Streamline difficulty is overcome, completely displace the very untrustworthy streamlined solid wire, for reasons already very well known to those whose experience in the aircraft industry matters; reasons which need not be detailed within the scope of the present article. *En passant*, Mr. Henry Fowler (the Superintendent of the R.A.F.) pleaded for a better and greater knowledge of the steels used in wires, recently.

A wire rope is frequently the weakest link in the strongest of engineering structures. Failure of this link has been responsible for some of the most serious accidents recorded in the annals of engineering. A good wire rope invariably enhances its maker's reputation, and this is especially the case in aeroplane construction. It is, therefore, essential that both manufacturer and consumer should take every precaution to ensure that the material produced has sufficient strength and elasticity to withstand the severe stresses and duty imposed upon it.

The writers' opinion, based upon many years' experience in the manufacture of both wire and rope, is that elasticity is no less important a factor in deciding the quality of a rope than tensile strength, and that it is fallacious, in the extreme sense, merely to consider the breaking load of a wire, in finished rope form, as epitomising *quality*. In the air, the strains encountered are exceptionally severe upon ropes, although the near future may provide some simple form of streamline fairing which will counter the intensity of what may be termed "vibrant strains" (see figures 1 and 2).

#### HEAD RESISTANCE OF VIBRATION.

The fairing reduces vibration and minimises the strain upon the wire; the absence of vibration reduces resistance to motion very considerably. A small wire vibrating rapidly is quite able

to offer as much resistance to motion as a flat surface as wide as the amplitude of the vibrations (figure 2).

This point need not be laboured; enough has been said to make it evident that the conditions met with during motion in the air positively demand elasticity proportionately with tenacity. It would be as well, however, to point out that too much elasticity is a thing to avoid.

In the first place, there would be a tendency towards distortion of the main members of the machine; and, secondly, for a reason to be explained later, the reduced tensile strength of the material would necessitate heavier cables.

#### SPECIFICATION NEEDS.

The task, then, is to so order the progress of manufacture that a rope shall be produced having high tenacity governing weight, plus sufficient elasticity hereafter to be defined. To this end, all rope specifications should provide not only for torsion, bending and tensile tests of the individual wire after drawing, but also for the material in rod form before drawing, and in regard to the latter, analysis.

It is at this initial stage that certain manufacturers are tempted commercially to use a low grade, cheap rod (in pre-war days this was invariably of German manufacture—a line for which the Hun specially catered), relying upon the subsequent process of drawing to attain the hardness which to their opaque sense means "tenacity."

It has long been regarded as common practice amongst manufacturers, whose commercial sense subordinates the purely technical, that to produce 120-ton quality wire from low carbon rod (i.e., mild steel about 30 to 35 tons per square inch) is good business, with an emphasis on the "P."

#### TRICKS OF THE TRADE.

To begin with, a manufacturer merely out for pelf, even in these critical days, can start the manufacture of his so-called high grade ropes *behind* the specification. He begins with a low carbon rod, and anneals the stuff, and, instead of very carefully drawing down by  $\frac{1}{2}$  to  $\frac{1}{4}$  gauge sizes, he ruthlessly (and, of course, commercially) pulls the rod down to the required size in steps of  $1\frac{1}{2}$  to 2 sizes, being compelled to do so in order to secure strength by concurrent hardening at the cost of elasticity.

In this process the material is most unmercifully stressed. In trade parlance, the "guts" are pulled out of it, and a considerable degree of hardness naturally ensues. This, of course,

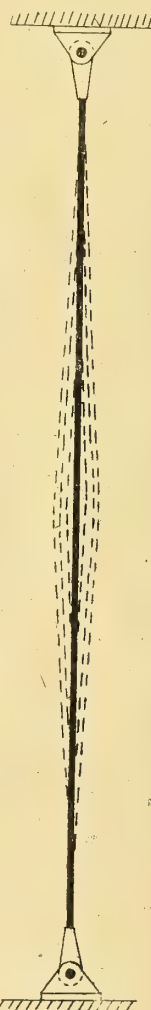


FIGURE 2.

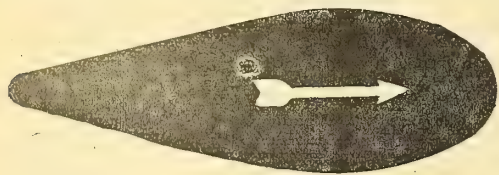
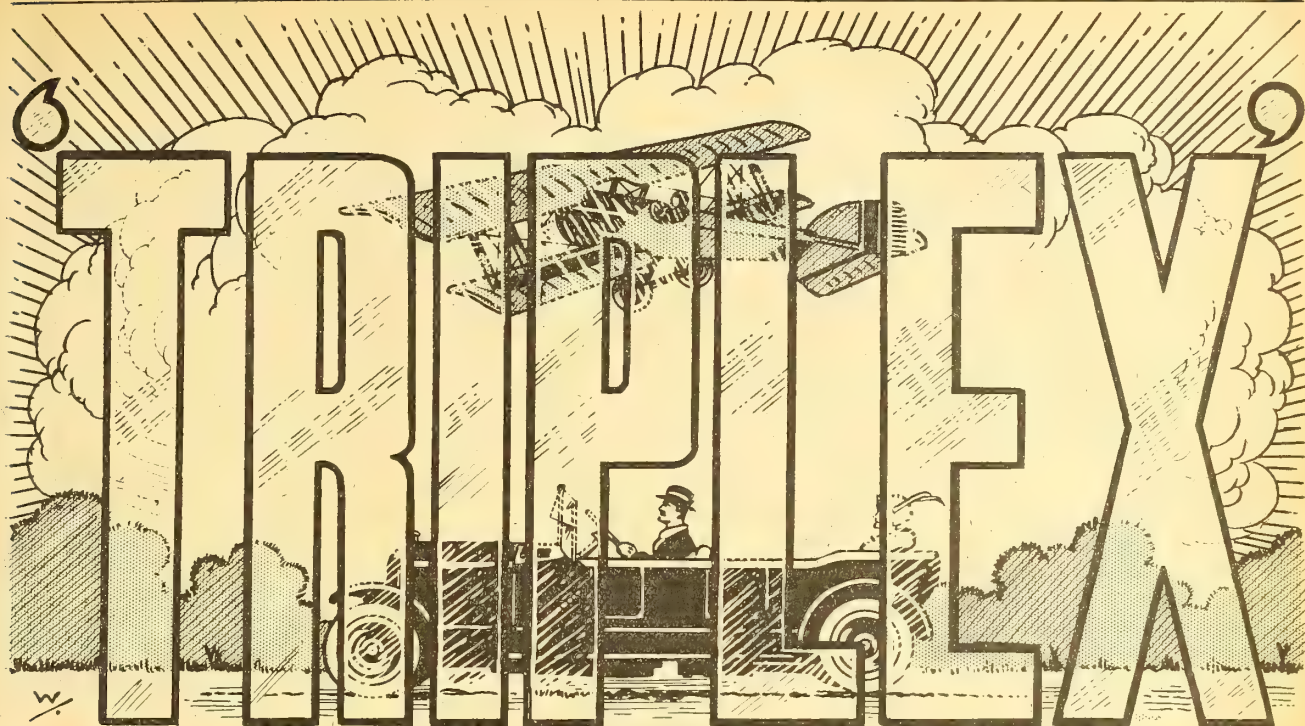


FIGURE 1





## Behind 'Triplex' Safety Glass

—absolute security and maximum safety is assured. "Triplex" should be insisted upon for Goggles, Windows, Windscreens, Aeroplane Observation Panels, Instrument Covers, etc. It *cannot* possibly "fly" or splinter, no matter how badly smashed it may become. Think what this means! Fit "Triplex" now—*before* the accident. Follow the example of leading flying men and motorists. There is only *one* "Triplex"; it is perfectly safe under all conditions—bullet and burglar-proof. Learn more about "Triplex." Catalogue mailed free.

**THE 'TRIPLEX' SAFETY GLASS Co., Ltd.,  
1, Albemarle Street, Piccadilly, London, W.1.**

### A Pilot writes:—

"You will be pleased to hear that 'Triplex' saved my eyes from being badly cut, and will be also interested to learn that the 'Triplex' Wind-screen was unbroken although the immediate surroundings were battered."

(EXTRACT FROM LETTER).

## Contractors to H.M. Admiralty and War Office.

### Telling Testimony.

"These 'Triplex' Goggles have undoubtedly saved my eyesight, as I fell a distance of 350 feet while on duty in France. The accident was caused by the collision of two machines in a snowstorm... both pilot and observer in one machine being killed, and the observer in the other, I being the only survivor."

(EXTRACT FROM LETTER).



contributes its quota to tenacity—the only objective to be attained according to specification, or nearly so. After these terrific drawing operations the wire is endowed with the remaining tenacity required by the addition of still more hardness in ways that are too well known, and easy of accomplishment, to need recalling here.

Now mark this point very carefully; one of the writers has known a rope manufacturer order 120-ton quality wire from his wire-drawer to be 135 to 140 tons tensile strength in individual wire form. The idea was that such abnormal wire would show a high tenacity when made up into rope form, with a straight pull test, and so satisfy inspection.

#### STOPPING THE GAME.

With proper inspection, and a suitable specification, such practice as this would immediately cease, and all wire showing a breaking stress greater than 125 tons would be rejected as *abnormal*. A firm manufacturing both wire and finished ropes is the most difficult to deal with, for, when parcels of their own wire turn out to be abnormally hard, it is a great temptation to shove it into the rope. On the other hand, a firm having had such wire supplied to them, could easily, and without loss to themselves, return the wire to the makers.

The future of rope production for aircraft will have to be controlled by such new specifications as will demand not only a breaking load, but also a satisfactory amount of elongation.

#### INTENSIFYING HARDNESS.

We have described the loss of elasticity as being due to hardness, and how that hardness is produced, but we must also describe how such hardness is frequently further intensified by the very high machine speeds at which stranding and closing of the rope is carried out.

Figure 3 indicates what takes place during drawing. If the stresses, during manufacture, were kept within the range AB, the elastic limit B would not be passed, and hardness would not be encountered. If, however, the stresses produce a condition represented by point C, some distance beyond the elastic limit, the material will then have received a certain amount of permanent set. In other words, hardness has crept in, and the material is said to be *hard drawn*.

On removing the load, the specimen returns to the condition represented by the point C (i.e., it has received a permanent set equal to AC). Similarly, if the loads are carried to points D E F and G, the material will be taking on more and more permanent set, until finally the breaking point H is reached. It is evident that were the load applied at A, the material would break with practically no further extension. B is the primitive elastic limit of the material, whilst C D E and F and G are artificial elastic limits corresponding to different degrees of hardness.

In diagram 3, the condition of the carefully-made rope would probably be between points C and E. Beyond point E the material possesses too much hardness, and would be altogether unsuitable for any practical purpose whatever.

#### REASONABLE LIMITS.

Hardness can be kept within reasonable limits in three ways:—

(a) By giving careful heat treatment during manufacture.

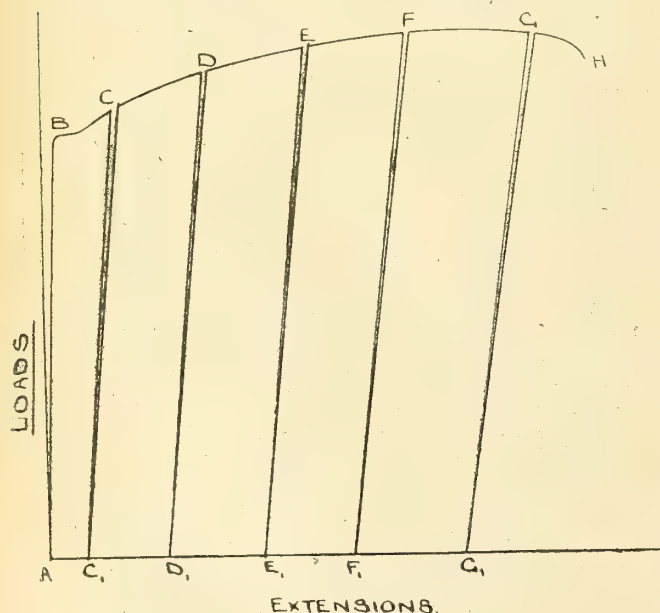


FIGURE 3.

- (b) By carefully drawing down the wire by  $1\frac{1}{2}$  to 1 sizes.
- (c) By using suitable speeds (moderate) for stranding and closing the rope.

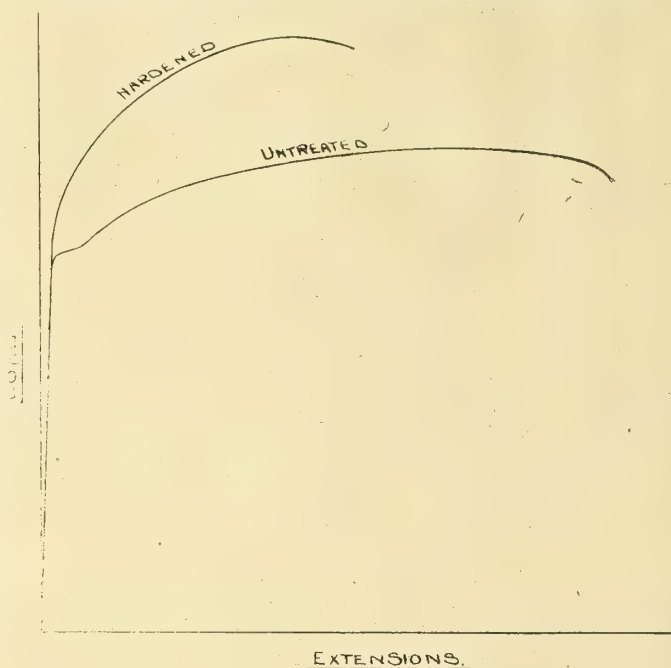
A certain amount of hardness is desirable, for this reason. It has been pointed out, and will be proved experimentally later, that increased hardness means, in the case of steel, increased tensile strength. Thus for a given weight, hard drawn steel wire will support a heavier load than the untreated steel.

But it must always be remembered that the increased tenacity has been obtained at the expense of elasticity, and the sacrifice should never be carried so far that the material becomes dangerously brittle. The most efficient rope is one which weighs the minimum amount per unit load, and yet possesses sufficient toughness to withstand the shocks met with in practice.

Diagram 4 illustrates the above point very clearly. It shows how hardening the material raises its tensile strength and reduces its elasticity (or, more strictly, its plasticity).

#### RELATION BETWEEN HARDNESS AND TENSILE STRENGTH OF STEEL.

The senior collaborator of this article has collected Brinell data over an extended period, and after averaging the results of very



EXTENSIONS.

FIGURE 4.

many personally conducted tests on each Brinell number, has tabulated the averaged results (figure 5). This table gives the Brinell number, and its usual average tensile equivalent in every-day practice. It has proved most useful to the writers, representing as it does thousands of tests, and provides a ready means of estimating the probable tensile strength, once the Brinell number is known.

The results embodied in figure 5, are exhibited graphically in figure 5A. There is a zero reading which is most probably accounted for by a constant error in either testing machine.

The relation, however, is:—

Tensile strength in tons per square inch =  $0.213 \times \text{Brinell No.} + 5$ .

In the report of the Hardness Tests Research Committee (Proceedings Instn. Mech. Engineers, Oct.-Dec., 1916), Dr. Unwin stated that the ratio of tensile strength to Hardness number is very nearly 0.325.

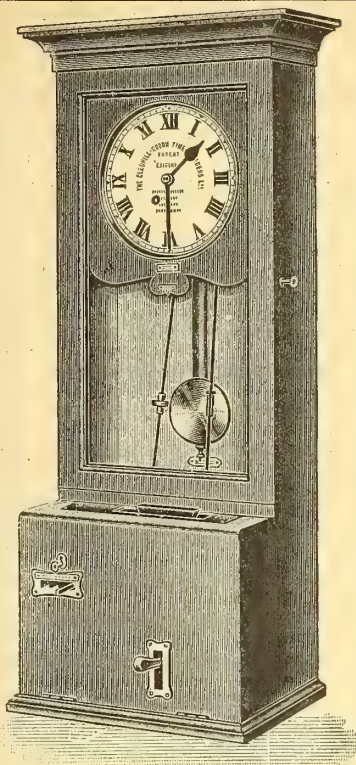
In the writers' case, 191 averaged readings were taken from thousands actually recorded, and when plotted to a large scale, they could be entirely covered by a strip of paper  $\frac{1}{8}$ -in. wide. It is reasonable to assume, therefore, that tensile strength and hardness are inter-connected as far as steel is concerned, so that one can be taken as a measure of the other.

#### MANUFACTURING PROCESSES.

Having thus digressed into the domain of hardness testing, and emphasised its great utility, we will resume our criticism of manufacturing practice, and the rather culpable neglect of those concerned, under which such practices still continue.

It has been previously mentioned that the manufacturer's usual practice is to stress his wire at very high speeds through very





## The Recorder which stamps the definite minute—

IN MANUFACTURE every effort is made to produce a reliable strong machine.

Only best materials are used and the Recorders are British throughout

We are supplying H.M. Government and Government Controlled Factories, also many Aeroplane Works.

— CATALOGUE FREE ON APPLICATION. —

### COMBINED TIME AND JOB CARD for recording complete labour cost.

The "IN" and "OUT" time is recorded on the card, also the time when jobs are changed.

The **TIME on the Job** is cast out at the side of card and the total hours entered in the Job No. column under the Job number.

**Unfinished Jobs** are entered at the foot with Job number and the total hours worked up to the week-end under column headed "Carried Forward," and transferred to the next week's time card in the column "Brought Forward," any time worked on this job during the second week is entered in the column, "Time for this Week." If the job is completed during the second week, the total is added and entered in the "Jobs Finished" column. If the job is not completed, the total is entered in the column "Carried Forward," which will in turn be entered on the third week's time card.

**STANDING ORDER NUMBERS** for constantly recurring Non-Productive Jobs are represented on the card, e.g. K.31 Grinding Tools; E.53 Making a New Lathe Tool.

#### SYSTEM B.

CHECK No.		WEEKLY TIME CARD.			
315		Week ending 18 Aug. 1916			
		Name <i>Thos Johnson</i>			
Job No.	IN-ON	OUT-OFF			
1360	5 59 SA				5½
	8 29 SA	12 01 S			
	5 59 M				9½
32	8 29 M				
	1 29 S	5 02 S			9½
	5 59 TU				
475	8 29 TU				
	1 29 S	5 01 S			
	5 59 W				
1510	8 29 W				
	1 29 S	3 00 S	32 M	7½	
	3 00 S				9½
11½ Hrs	6 00 TH	5 01 S		2	
	8 30 TH				
	1 29 S	5 00 S	11½	9½	9½
K.31	6 00 M				
	7 00 F	7 00 F		1	
	8 29 F				
E.53	10 00 F	10 00 F		2½	
	1 30 M				
	4 00 M	4 00 M		5	
1469		5 00 M		1	9½
TOTAL FOR WEEK					53
Job No.	Brought Forward	This Week	Jobs Finished	Carried Forward	
1360	16	32	48		
1469				1	

## THE GLEDHILL-BROOK TIME RECORDERS, LTD.

26, Victoria Street, S.W.1. Telephone: Victoria 1310.

EMPIRE WORKS, Huddersfield. Telephone: 1069

44, Hill Street, Birmingham. Telephone: Midland 2086

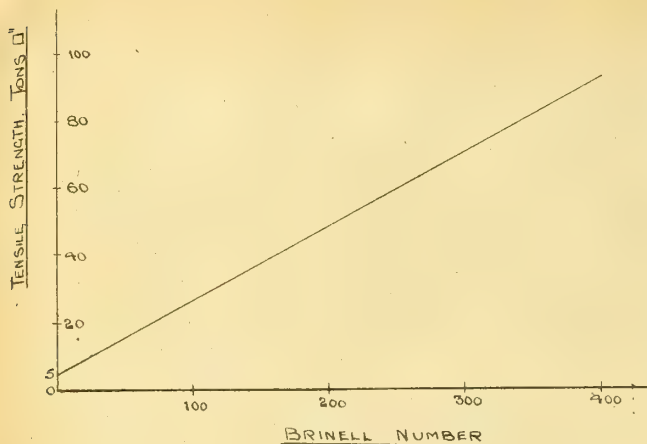


FIGURE 5A.

imperfectly made machines, hitting the wire terrific blows, as a direct consequence of such speeds, in a contraption fixed on the stranding machine, called a closing die.

The wire is drawn from the bobbins (which are mounted on fliers, at a rather imperfect angle), through the closing die, thence round a large diameter drum, and so on to a take-off, or delivery, reel.

It will probably not be quite readily believable that the same speed at which very ordinary mild steel wire of the most ductile quality is stranded, remains unaltered when the same machine is used for the stranding and manipulation of high-tensile wire, supposedly of the highest quality.

The writers' opinion has been confirmed that the many failures, not during the actual test but afterwards, when the bulk of the rope has been put into service, can be traced to the terrible stressing of the individual wires through being laid together in stranding at such high speeds. The same criticism applies, but in a lesser degree, to the operation known as "closing," i.e., when the finished strands are laid together and twisted into rope form. It very frequently happens, within the writers' observation, that the wires forming the crown of the rope, or the outside wires, are cut during their rapid or forceful passage through the ill-fitting closing die, sufficient to reduce their tensile strength, individually, 50 per cent.

#### A POINT FOR THE AIR BOARD.

A point worth mentioning here, in the event of these notes attracting the attention of the Air Board, is that steel ropes intended stranding members on aircraft need not possess much

flexibility of construction, such as inner and outer drag-wires, lift-wires, and diagonal bracing, as usually specified. These could, with considerable advantage, and greater longevity, be, preferentially, "Lang's Lay" instead of the ordinary Lay (i.e., the strands and rope layed opposite hands), and so causing additional stress. The ideal, of course, is to lay a rope, composed of such high-grade wire, into as nearly the semblance of a straight bundle of wires as practical conditions permit. Ordinary lay-practice is, of course, properly suited to control-wires, flexibility being in that case a *sine qua non*.

#### A METHOD OF TEST.

The following is, perhaps, the most satisfactory method of testing wire ropes in finished form; it provides a means of measuring extension, so very essential to a proper appreciation of the quantity of the material. The load is run up to 25 per cent. of the guaranteed breaking load, it is then taken off, and the permanent set can easily be measured with an ordinary foot-rule.

This operation is repeated for loads of 50 per cent. and 75 per cent. of the breaking load, and finally the breaking load itself is recorded. An extension of 5 per cent. to 10 per cent. on a length of about 25 inches should be insisted upon. Care must be exercised to ensure that the initial straightening out of the strands is not measured as extension.

To effect this one-sixth of the breaking load is allowed for straightening out the wire. The ultimate tensile strength is then 6/5ths of the value recorded by the testing machine.

To sum up, the average manufacturer of high-tensile steel-wire ropes, does not appear to appreciate a technical principle in the manufacture of his product, and so long as consumers are satisfied with a high-tensile strength merely, which has been obtained at the expense of ductility, so long, then, will there be failures in the air.

#### SOME RECOMMENDATIONS.

The Air Board would be well advised to provide for analysis, and, at least, tensile and bend tests of the steel (*whilst in rod form*), before the manufacture of wire ensues. Then there should be a very searching torsion test of the finished individual wires, with, of course, a tensile test.

The ideal specification should also include a maximum rate of speed for all machinery forming high-tensile wires into strands, to safeguard against stressing the wires at too high a speed.

Other points in the specification would include a proper sequence of gauge sizes for drawing the wire, and a limit to hardness after drawing, to ensure ductility, with tenacity.

There is also the sequence of progressive tensile tests on the finished rope previously outlined to be considered, in order to discover abuse.

The specification might also include directions as to ordinary lay for all ropes applied to really flexible members, e.g., controls, and for Lang's Lay for stranding members.

In both the writers' opinions, speaking from years of wide

BRINELL NUMBER	TENACITY TONS IN²	BRINELL NUMBER	TENACITY TONS IN²	BRINELL NUMBER	TENACITY TONS IN²	BRINELL NUMBER	TENACITY TONS IN²	BRINELL NUMBER	TENACITY TONS IN²	BRINELL NUMBER	TENACITY TONS IN²	BRINELL NUMBER	TENACITY TONS IN²	BRINELL NUMBER	TENACITY TONS IN²	BRINELL NUMBER	TENACITY TONS IN²	BRINELL NUMBER	TENACITY TONS IN²
99	25.9	131	32.8	163	39.3	195	45.8	226	52.5	257	59.5	290	66.5	326	74.2	366	83.3	411	93.1
101	26.3	133	33.1	164	39.6	197	46.1	227	52.8	259	59.8	292	66.8	328	74.9	369	84.0	414	93.8
102	26.7	134	33.4	165	39.9	198	46.4	228	53.2	260	60.2	294	67.2	330	75.2	371	84.3	417	94.5
104	27.1	136	33.8	167	40.2	200	46.7	230	53.5	261	60.5	295	67.5	332	75.6	372	84.7	420	95.2
106	27.5	138	34.1	169	40.6	201	47.1	232	53.9	263	60.9	296	67.9	334	76.3	374	85.0	423	95.9
107	27.8	139	34.4	170	40.9	203	47.4	234	54.2	265	61.2	298	68.2	336	76.6	376	85.7	426	96.6
109	28.2	141	34.7	172	41.0	204	47.7	236	54.6	266	61.6	300	68.6	338	77.0	378	86.1	429	97.3
111	28.5	143	35.0	174	41.6	206	48.0	237	54.9	268	61.9	302	68.9	340	77.7	379	86.4	432	98.0
112	28.8	144	35.4	175	41.9	208	48.4	238	55.3	270	62.3	304	69.3	342	78.0	380	86.8	435	98.7
114	29.2	146	35.7	177	42.2	209	48.7	240	55.6	271	62.6	306	70.0	343	78.4	383	87.1	438	99.4
115	29.5	147	36.0	179	42.5	211	49.0	242	56.0	273	63.0	308	70.3	344	78.7	385	87.8	441	101.1
117	29.8	149	36.3	182	43.2	213	49.3	243	56.3	275	63.4	310	70.7	346	79.1	387	88.2		
119	30.2	150	36.7	183	43.5	214	49.7	244	56.7	277	63.7	312	71.0	348	79.4	390	88.9		
120	30.5	152	37.0	180	42.8	216	50.0	246	57.0	278	64.0	313	71.4	349	79.8	393	89.6		
122	30.8	153	37.3	185	43.8	217	50.4	248	57.4	279	64.4	314	71.7	351	80.1	395	89.9		
124	31.1	155	37.6	186	44.1	218	50.7	249	57.7	280	64.7	316	72.1	353	80.5	396	90.3		
125	31.4	156	38.0	188	44.5	220	51.1	250	58.1	282	65.1	318	72.4	355	81.2	399	91.0		
127	31.8	157	38.3	189	44.8	221	51.4	252	58.4	284	65.4	320	72.8	358	81.5	402	91.7		
128	32.1	159	38.6	191	45.1	223	51.8	254	58.8	285	65.8	322	73.5	361	82.2	405	92.0		
130	32.5	161	38.9	193	45.4	225	52.1	255	59.1	286	66.1	324	73.8	364	82.6	408	92.7		

FIGURE 5



# EMAILLITE

NON-POISONOUS

AEROPLANE DOPE.

*THE ORIGINAL AND STILL THE PREMIER.*

AS  
TIGHT



*Trade Mark.*

AS  
A DRUM.

THE BRITISH EMAILLITE CO., LTD.,

*Contractors to the Air Board.*

Registered Offices:

30, Regent Street, Piccadilly, S.W.1.

Wire—"Ridleytren, Piccy, London."

'Phone—280 Gerrard

Works

5, Hythe Road, Cumberland Park,  
Willesden Junction, N.W.10.

Telephone—Willesden 2346 & 2347.

experience, both in the manufacture, and testing of wire and rope, such a specification is worth earnest consideration.

#### ANNEALING.

In conclusion, a word with regard to annealing might not be out of place. Dr. W. H. Hatfield, of the Research Laboratory, Sheffield, stated in one trenchant sentence that the presence of foreign matter, such as sulphur and slag, in steels intended for aero work, creates the danger of failure under stress.

## The Wind Channel: Its Design and Use.

BY J. R. PANNELL.

On Nov. 21st the second meeting of the current session of the Aeronautical Society of Great Britain was held at the Royal Society of Arts, the Chairman being Sir Richard Glazebrook, Director of the National Physical Laboratory.

Mr. J. R. Pannell read a paper on "The Wind Channel: Its Design and Use," which is reproduced hereafter. Pressure on space made a report at the time impracticable.

Mr. Pannell said: It has long been realised that experiments in the laboratory on small models afford in certain cases a means of obtaining, cheaply and rapidly, information on the behaviour of the actual structure under the conditions in which it is to be used. This plan has been adopted in many branches of science, and in none to a larger extent than in naval and aeronautical architecture. The problems to be investigated are usually those connected with the motion of bodies through a fluid, but if we accept the principle of relative motion we have an alternative method open to us for our model experiments. We may, if we wish, reverse the conditions and set the fluid in motion, the model remaining stationary.

Generally speaking, one plan has been adopted in naval architecture and the other in aeronautics. In the former case models are towed through water in a ship tank, while in the latter they are placed in a tube through which air is passed. One difficulty in the case of the moving fluid is to estimate the velocity, and, mainly for this reason, a certain amount of experimental work has been carried out in air by moving the body on a whirling arm. This plan was invaluable in providing a standard anemometer calibration, but this done, there is only an extremely small amount of work which cannot be carried out more satisfactorily in the wind channel.

The stationary model offers many advantages, particularly in connection with measurements of the forces acting upon it, and the writer is of the opinion that the method might be applied with advantage in experiments on ship models to a greater extent than has hitherto been the case.

The application of model results to the actual structure is often a matter of considerable difficulty, but as the amount of information obtained in aeronautics increases it appears probable that the change of the coefficients in passing from model to full scale, which is small in the majority of cases, will soon be known with considerable accuracy. Under these circumstances the value of model experiments becomes very high, and it appears that the performance of an aeroplane can be predicted by this means with considerable accuracy.

It must be clearly understood, however, that the value of model experiments is entirely dependent on their accuracy. Changes in parts of an aeroplane may often cause appreciable differences in the performance, though the parts themselves may be so small as to be difficult of reproduction at all on a 1/12th scale model.

An instance of this may be cited. It has been stated that in a certain type of aeroplane the substitution of streamline for circular wires caused an increase of 10 miles per hour in the speed, yet it is quite certain that only the highest experimental accuracy would enable the difference to be measured on a 1/12th scale model.

The present paper is concerned with the methods which are now in use in carrying out experiments in a wind channel.

Again, some experiments were carried out on a 1/25th scale model of a large biplane in order to determine, among other things, the angle at which the tail plane of the machine should be set and the position of the rudder hinge, in order that the rudder should be just stable. The model experiments determined the required angle of the tail plane, and showed that the rudder would be neutral if the hinge were moved forward a few thousandths of an inch. The determination of the latter quantity represented the extreme limit of accuracy, but it was found in the actual machine that the rudder was rendered stable by a forward movement of the hinge of an inch or so. Moreover, this machine was one of the earliest of its size, and it was feared that an error in the setting of the tail plane (which was based on the results of the model experiment) might give rise to forces on the machine greater than those which could be exerted by the controls. The machine, however, carried out its trials without accident, and its prototype is to-day one of the most successful British bombers.

If it be conceded that the model experiments prevented accident to only one machine, the saving in mere money was sufficient to carry on the work of the entire Aeronautical Department of the

It is not quite a moot point with the writers that this danger is not incorporated during the process of annealing, since *heat quality* is no less important than *heat quantity*. The very hazardous conditions under which *heat quality* is applied, through the agency of the heat medium used, usually very impure gas, react upon the material under treatment. This, being in a highly susceptible state of molecular activity, is bound to be affected by impure heat quality.

National Physical Laboratory for many months. The present paper deals with some of the methods and apparatus which have been employed in carrying out experiments in a wind channel.

#### VARIOUS TYPES.

When the author was invited by the Secretary of the Society to prepare a paper on "The Wind Channel" he was at once impressed by the fact that such a general title could only be justified if a description of all the channels in which satisfactory experiments had been carried out was included. An attempt has therefore been made to describe briefly the more important channels of the world, as far as they are known to the writer, the greatest attention being paid to those in which results of obvious value have been obtained.

The author's actual experience is, however, limited to the channels at the National Physical Laboratory, and the paper must be regarded as mainly a description of that type. It is difficult to avoid bias in favour of apparatus with which one is familiar, but the writer believes that this type of low resistance channel, in which the air is drawn from a large reservoir, is unequalled for accuracy and rapidity of operation.

This view was supported by Lt. J. C. Hunsaker, of the United States Navy, who, after a tour of the principal aerodynamical laboratories of the world, recommended the erection at the Massachusetts Institute of Technology at Boston, U.S.A., of a 4-ft. channel which in all the essential details is an exact copy of those at the N.P.L.

It may be remarked that considerable progress has been made since the apparatus and methods described in this paper were in use, but the exigencies of the present situation forbid the publication of any further details.

It will be convenient to group the channels under the countries to which they belong, and we may commence with the one which perhaps did more than any other in the early days of aviation towards the development of practical types of airships and aeroplanes.

#### FRANCE.

A small wind channel was erected at the military establishment at Chalais-Meudon, which was in charge of Col. Renard, as long ago as 1877, and constitutes the earliest channel known to the writer. It was 13ft. long, and had a diameter of 2½ft. A considerable amount of work appears to have been carried out on models of airships, but the results were regarded as confidential, and were not published.

A very extensive laboratory was founded in 1911 by M. Deutsch de la Meurthe at St. Cyr. It includes laboratories, workshops, administration building, several wind channels, and an open-air track upon which runs an electrically-driven carriage. Experiments are made on this carriage with full-size aeroplane wings, and it is by this work that the St. Cyr Laboratory is most generally known.

No details of the channels are available, but the form is understood to be circular with the balance situated underneath the channel.

A very large amount of experimental work has been carried out in the laboratory of Eiffel, situated in the Champ de Mars, Paris. The laboratory was constructed about 1910, and contained a circular channel nearly 5ft. in diameter, in which experiments were made in continuation of those with falling plates on the Eiffel Tower. The characteristic feature of the channel is that the experiments are made in an hermetically sealed room, in which the pressure is equal to the static pressure in the channel. The air stream crosses this room without any solid boundary, and it is stated that larger models can be used than is the case if the stream is confined within rigid boundaries, no sensible eddies being set up. The length of the channel is 12ft., and a conical receiver projects slightly into it on the outlet side.

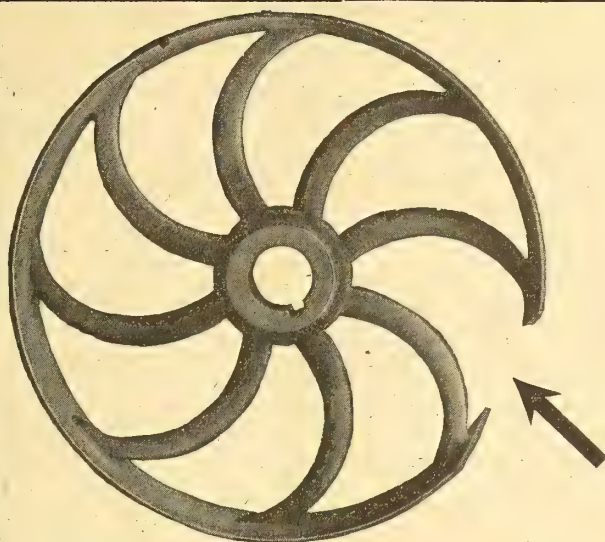
A balance is provided for measurement of lift, drag, and moment, the observers sitting on a platform above the free stream.

A 65 h.p. motor was used, and a speed of 65ft./sec. attained. Several anemometers of the pressure head type were employed, and compared with the drop of pressure in the closed chamber. The velocity calculated from this pressure difference by the formula

$$V^2 = 2gh$$

was 1½ per cent. higher than that given by the pitot tube. A new laboratory was opened in 1912 at Auteuil. The channel is





*Cast iron pulley wheel about 5 feet in diameter, with large piece broken out of rim.*

# Let BARIMAR repair your Factory Machinery

**N**OTHING in the way of welding is beyond the scope of Barimar Welding Specialists.

Whenever a breakage occurs, send the part to Barimar at once. That will save you valuable time, and you will get a sound job at a reasonable price, plus a guarantee to refund money if repair proves ineffective.

Barimar Welding Service is used by practically all Government Departments and by the leading Munition Works. You cannot go wrong if you follow their example.

Get the name "Barimar" impressed on your memory, for it is certain that you will need this service sooner or later.

Meantime, write for **Free Booklet** "B C," entitled "How Barimar Performs Miracles"—a technical journalist's description of Barimar Factory Methods. Please mention "*Aeroplane*."

**How to send repairs:** Remove all fittings. Attach label with your name and address, and send carriage paid. Send full instructions by post.

Address repairs to Dept. "B C"—

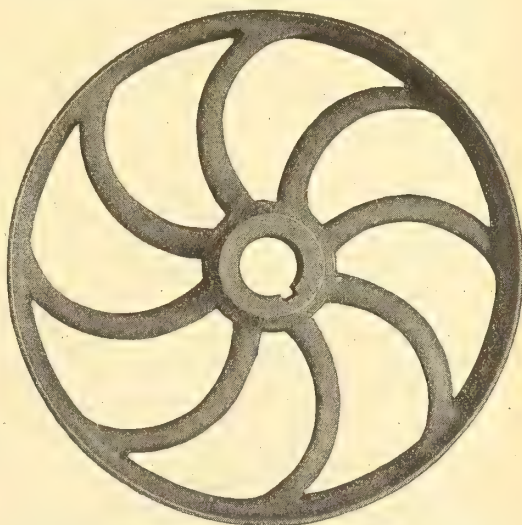
# BARIMAR

LIMITED.

10, Poland St., London, W. 1

Telegrams—"Bariquamar, Reg. London."

Telephone—Gerrard 8173.



*Pulley wheel with new part welded in, machined, and cleaned up. Tested to stand same strain as original casting.*



constructed on exactly the same principle as the earlier one, but the diameter has been increased to 6½ ft. The air is led into the test chamber by a reducing cone whose diameter changes from 13 ft. to 6½ ft. in a length of 1 ft. The stream leaves the test chamber by a bell-mouthed opening, and passes to the "discharger," which is a cone increasing from a diameter of 6½ ft. to 1 ft. (which is the diameter of the fan) in a length of 30 ft. This design is stated to be very efficient, as the air reaches the fan at a low velocity and at a pressure little above that of the hall into which it is delivered. A 50 h.p. motor is provided, and a maximum speed of 100 ft./sec. is attained.

Experiments have been carried out in these channels covering a very wide range of subjects, including the determination of forces and moments on aerofoils, complete models, and bodies, pressure plotting experiments, and tests on series of airscrews.

The convenience of an arrangement which enables the observers to be placed in the sealed test chamber is no doubt great, but it is open to question whether the accuracy of results obtained in this free current is so high as those obtained by the more generally accepted methods.

It has been shown that an error of 0.2 deg. in the assumed wind direction would cause an error of 6 per cent. in the value of the drag of an aeroplane model.

#### ITALY.

The principal aerodynamic laboratory in Italy is that of the Brigata Specialisti. It is situated near Rome, and is under the charge of Major Crocco. The apparatus includes a wind channel in which very elaborate precautions were taken to secure uniformity of the flow. The air was forced by the fan into a closed chamber, where the velocity was reduced and the pulsations partly damped out. It then passed to another chamber larger than the first, from which it entered the experimental channel, which was 2.5 ft. square. Several layers of gauze were introduced, and the flow was stated to be satisfactorily uniform to within a short distance of the wall. The model was supported on the balance just outside the end of this channel, so that at the section of the stream at which the experiments were made there was no solid boundary.

Several balances were in use that provided for the most accurate measurements being supported on the surface of a vessel of water. The principal part of the wind force was balanced by weights attached to a cord passing over a pulley. Records of the movement of the balance were obtained by means of additional apparatus, in which electric sparks were passed through specially prepared paper.

In 1912 the laboratory was reorganised under the title To Stabilimento di esperienze e costruzione Aeronautiche del Genio, and a new wind channel of an entirely different type was erected. This channel is 6½ ft. square and 22 ft. long, the air current being produced by a Sirocco (centrifugal) fan, belt-driven from a 30 h.p. electro motor. The balance is placed in a sealed test chamber, there being a gap of about 3½ ft. at the position at which the experiments are made. The method of test is thus similar to that of Eiffel, except that the length of the "free" stream in which the measurements are made is much less. The test-room is divided into two parts, the upper of which contains the balance and its observer, while in the lower is placed the manometer and various other instruments. The speed of the air current can be regulated from this chamber by opening or closing shutters on the intake side of the fan.

Two anemometers are used, one situated upstream of the test section and another placed near the outlet of the channel. The uniformity of the flow is improved by the introduction, near the fan, of a layer of gauze and a honeycomb, and it is stated that over a period of one or two minutes (the time required for an observation) the flow can be kept sufficiently steady. The range of velocity available is from about 7 ft./sec. to 52 ft./sec. Experimental work of considerable value had been carried out in this laboratory till the year 1914, but information as to the results obtained since that date is not at present available.

#### GERMANY.

The principal Aerodynamic Laboratory in Germany was that at Göttingen, of which Prandtl was in charge. This channel is of the enclosed type, in which the air circulates continuously round an approximately rectangular path. The test section of the channel is 6½ ft. square, but if high speeds are required an octagonal liner can be fitted, reducing the diameter to about 3.3 ft. Guide blades are provided at the corners and a honeycomb and gauze screens are introduced to secure uniformity in the flow. To this end also the walls of the honeycomb are made double, so that any cell can be partly closed by bending one of the walls across it. The gauze is also rendered finer where necessary by painting. The arrangements for the measurement of forces are unique, separate balances being provided for lift and drag, a total of four being required for the complete investigation of forces and moments. The model is suspended on wires, and is restrained in a horizontal plane by two wires at an angle of 120 deg. to each other. One of these wires is fastened to the wall of the channel, while the other passes through it and is attached to the drag balance. The drag is calculated from the increase in tension of this wire when the air current is started.

Four supporting wires are brought to a light rod, placed along the wind direction, from which the model is suspended, but it appears to the writer preferable to attach the wires to the model directly, as in the case of a low resistance form the flow has been found to be very sensitive to small obstructions. This modification may perhaps have been subsequently introduced. Each pair of wires is taken to a balance above the channel for measurement of lift, and the fourth balance is used in obtaining rolling moments.

The velocity is measured by a kind of pitot tube with an inclined tube alcohol manometer, and an automatic regulator is provided to maintain a constant speed. This regulator consists of two bell jars, hung, with their lower ends under water, from a balanced arm. One jar is connected to the channel immediately in front of and the other immediately behind the airscrew, a pressure difference proportional to the square of the wind speed being thus obtained.

The speed is set to the desired value by the regulating resistances and a weight on the regulator balance set to a position marked upon it for the required speed. A change of speed now causes the balance arm to move over to one stop operating a resistance in the field circuit of the motor. The stops are also mounted on a swinging arm whose motion is damped by a vane moving in a fluid. This latter device reduced "hunting" due to over-regulation.

An electric motor drives the fan, a maximum speed of 33 ft./sec. being attained in the 6½ ft. channel and 55 ft./sec. when the section is reduced to 3 ft.

For several years before the war the work carried out in this channel dealt mainly with the resistance of streamline bodies, including measurements of pressure distribution. Experiments have also been made on the resistance of spheres, and to a limited extent on aeroplane models, though the latter branch of study has doubtless been extended recently.

#### AMERICA.

A wind channel was erected in an Aerodynamical Laboratory at Washington in 1901 by Mathilath. The section was 6 ft. square and the length 40 ft. The current was produced by a fan 5 ft. in diameter driven by a 12-h.p. electro motor, a maximum speed of 40 ft./sec. being attained.

It was provided with a balance for measurement of lift and drag, and with a torsion balance.

This channel was used by Zahm in 1904 for his experiments on the skin friction of flat boards. The method adopted was to suspend the boards by wires from the roof of the laboratory and observe their displacement under the wind forces.

No complete description of this channel has been available, but it appears to be of a satisfactory type. As far as the writer is aware, however, no important work has been carried out since that of Zahm.

A channel of the N.P.L. pattern has recently been erected in the Massachusetts Institute of Technology.

A large channel is installed at the Washington Navy Yard. It is of the loose circuit type, the dimensions of the working section being 8 ft. square and 33 ft. long. It is fitted with a honeycomb at the entrance to the working section, some of the cells being closed to improve the uniformity of the flow, which is said to be within 2 per cent. of the mean. The balance and motor control board are situated above the channel, the balance being similar to that used by Eiffel.

The current is produced by a 500-h.p. electro motor, driving a centrifugal fan; a maximum speed of 75 m.p.h. can be attained, but considerable heating of the air takes place at this speed and tests are usually carried out at 40 m.p.h. The velocity is measured by pressure tube anemometers, which have been calibrated against the N.P.L. standard.

#### RUSSIA.

The principal experiments in aerodynamics which have been made in Russia are those conducted at the Institute at Koutchino, near Moscow,\* under the superintendence of Riabouchinsky. The equipment includes a straight channel of circular section 4 ft. in diameter and about 48 ft. long. The air is drawn through the channel by a fan, which is belt-driven from an electro motor, and is returned through the building in which the channel is placed. A maximum speed of about 20 ft./sec. is attained, and a balance, whose axis is horizontal, is provided for force measurements.

Experiments in this channel have, on the whole, been of scientific rather than of an engineering character, and include observations on the resistance of spheres, autorotation of plates, resistance of square plates, etc. The reports issued include several relating to propellers.

#### GREAT BRITAIN.

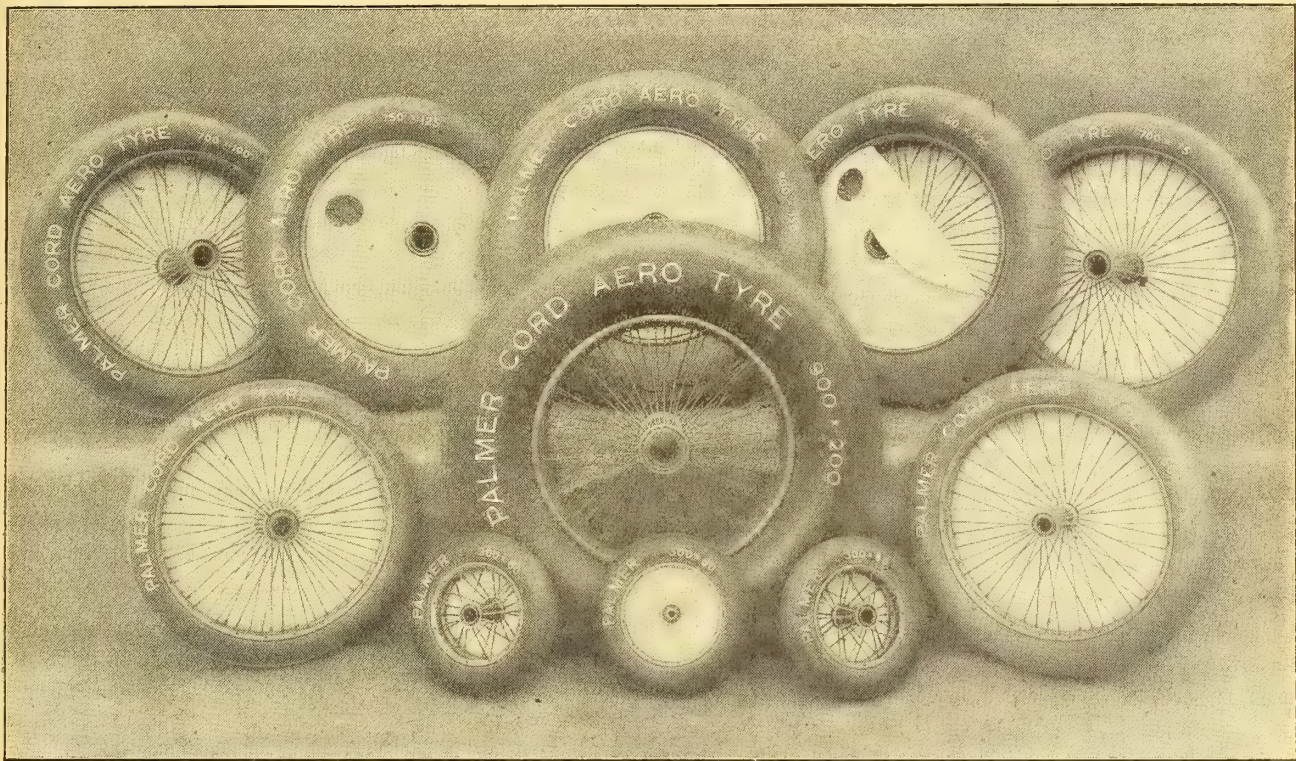
The principal aeronautical laboratory for model experiments in this country is at the National Physical Laboratory, and comprises five wind channels, enclosed whirling arm, small water channel, and two wind towers. A 4 ft. air channel is in use

\*Koutchino Bulletin Fase I 1906.



# PALMER

## LANDING WHEELS & TYRES



STANDARD SIZES:

Tyre Sizes	Wheel No.	Hub		Track Line	Tyre Sizes	Wheel No.	Hub		Track Line	Tyre Sizes	Wheel No.	Hub		Track Line
		Length	Bore				Length	Bore				Length	Bore	
		m/m	m/m	m/m			m/m	m/m	m/m			m/m	m/m	m/m
300×60	16	111.12	25.4	Central	700×75	*80	178.	44.45	132/46	750×125	96	178.	55.	132/46
"	17	72.39	12.7	Central	"	*91	178.	31.75	132/46	800×150	82	185.	55.	135/50
450×60	30	89.	31.75	Central	"	*98	178.	44.45	Central	"	85	185.	55.	Central
575×60	111	150.	38.09	104/46	700×100	92	185.	55.	135/50	"	†36	185.	55.	135/50
"	21	160.	28.	Central	"	95	185.	55.	Central	"	†40	185.	60.32	135/50
"	34	150.	31.75	104/46	"	77	178.	44.45	132/46	1000×150	97	250.	65.4	Central
650×65	78	178.	44.45	132/46	"	93	150.	40.	Central	"	102	185.	55.	125/60
"	100	178.	38.09	132/46	"	33	150.	38.09	Central	"	201	185.	60.32	125/60
"	101	178.	31.75	132/46	"	99	178.	38.89	132/46	900×200	39	185.	55.	Central
600×75	111	150.	38.09	104/46	750×125	92	185.	55.	135/50	"	42	185.	60.32	125/60
"	21	160.	28.	Central	"	95	185.	55.	Central	"	47	185.	55.	125/60
"	34	150.	31.75	104/46	"	77	178.	44.45	132/46	1100×200	202	185.	60.32	Central
700×75	78	178.	44.45	132/46	"	93	150.	40.	Central	"	52	185.	55.	116/69
"	100	178.	38.09	132/46	"	33	150.	38.09	Central	"	57	185.	55.	Central
"	101	178.	31.75	132/46	"	99	178.	38.89	132/46	"	203	185.	60.32	116/69
										"	204	185.	60.32	Central

\*Wheels Nos. 80, 91 and 98 are fitted with a wider and stronger rim, and the 700x75 tyres when fitted to this rim caliper 83 m/m.

†Wheels Nos. 36 and 40 are of stronger type than the other wheels for 800x150 tyres.

## THE PALMER TYRE LIMITED

Contractors to the Admiralty and to the War Office,

119, 121, 123, SHAFTESBURY AVENUE, LONDON, W.C.2.

Telegrams: "TYRICORD. WESTCENT, LONDON."

Telephone: GERRARD 1214 (Five lines).

PARIS: 24, Boulevard de Villiers, Levallois-Perret.

**Contractors to the Admiralty and Air Board.**

**THE  
CENTRAL AIRCRAFT  
COMPANY.**

**DESIGNERS AND CONSTRUCTORS  
OF AIRCRAFT.**

***Office and Works :***

Telegrams: **AVIUDUCTION, PHONE, LONDON.**  
Telephone: **HAMPSTEAD 4403, 4404.**

**KILBURN, N.W.6.**



**WOODSIDE ENGINEERING COMPANY, LTD.,  
POSSILPARK, GLASGOW.**

# **AEROPLANE TIERODS**

: IN :

**STREAMLINE AND ROUND SECTIONS**

**COMPLETE WITH**

**UNIVERSAL OR FORK JOINTS**

**LARGE STOCKS.**

---

**PROMPT DELIVERY.**

---

**Telephones.**

**WORKS: 1495 Douglas (2 lines.)**

**OFFICE: 3456 Central (3 lines.)**

(Private Branch Exchange.)

**Telegrams: "FUSELAGE," GLASGOW.**

**Registered Office**

**50 WELLINGTON STREET,  
GLASGOW.**

# MANNECERTON & Co.Ltd.

CONTRACTORS TO THE ADMIRALTY  
AND H.M. WAR OFFICE.

## Designers and Manufacturers of Proved Efficiency of all Types of AIRCRAFT

HEAD OFFICE AND WORKS

**AIRCRAFT WORKS, NORWICH**

---

SPECIAL DEPARTMENT

for the manufacture of

AIRCRAFT ACCESSORIES

(Strainers, Bolts and Nuts, etc., etc.)

177, CLEVELAND ST., LONDON, W.1.

# MANNECERTON & Co.Ltd.

LONDON

NORWICH

IPSWICH

BURY ST. EDMUNDS.

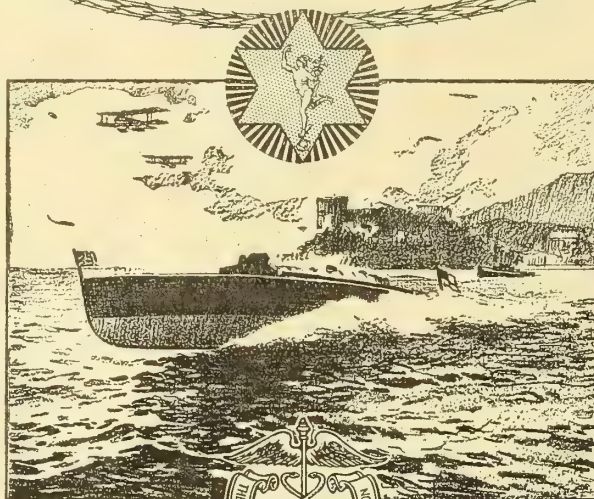




# S.E. SAUNDERS

LIMITED  
Est. 1830

DESIGNERS & CONSTRUCTORS  
OF AIR AND MARINE  
CRAFT



Head Office and Productive Works  
**EAST COWES. I.W.**  
Erecting & Testing

Solent Yard, Cowes &  
Osborne Works, E. Cowes  
SEAPLANES

West Medina Aerodrome  
East Cowes  
LAND MACHINES

Telegrams "CONSUETA EAST COWES"  
Phone COWES 193 (4 Lines)



“ “ CONTRACTORS TO “ “  
HIS MAJESTY'S WAR OFFICE

*Messrs. Gordon Watney & Co. Ltd.*

**AERONAUTICAL AND  
GENERAL ENGINEERS**

**South Lodge Motor Factory**

**WEYBRIDGE**



**Telephones WEYBRIDGE 550 (7 lines),      Telegrams: "MERCEDES, WEYBRIDGE."**

CONTRACTORS TO THE ADMIRALTY AND AIR BOARD.

# **C. G. Spencer & Sons** **LIMITED.**

**AERONAUTICAL ENGINEERS.**

MAKERS OF

**KITE BALLOONS,  
PARACHUTES, AIRSHIPS**  
and  
**Balloons of Every Type.**

**FABRIC, ROPES, KITE CORDS, VALVES, BASKETS, and  
Aeronautical Apparatus of every description.**

**THE PIONEER FIRM.**

**FIRST IN 1835.**

**FOREMOST TO-DAY.**

*Works :*

**Highbury, Clapton, Hackney & Brixton,  
LONDON.**

**Head Office: 56a, Highbury Grove, London, N.5.**

Telegrams : "AERONAUT, LONDON."

Telephone : DALSTON 1893.



# **WILLIAM BEARDMORE & CO. L<sup>TD</sup>.**

Aviation Department

Dalmuir, near Glasgow

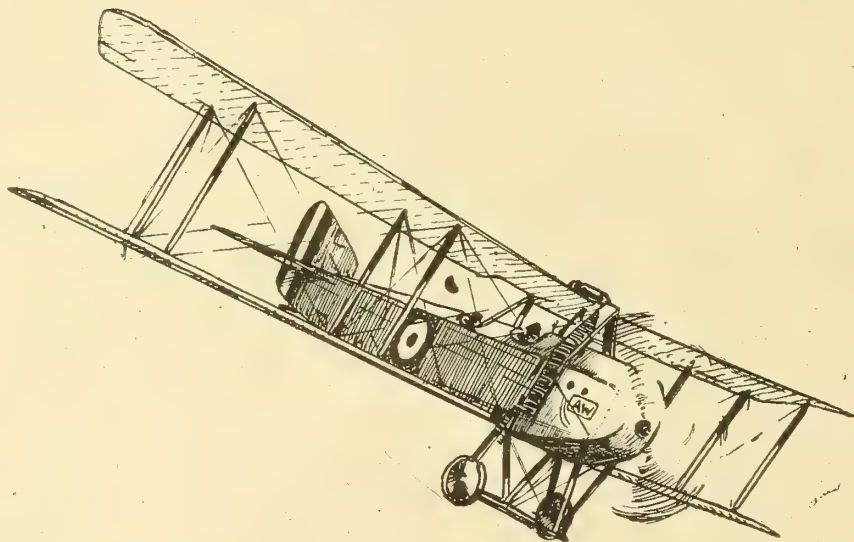
## **AIRCRAFT MANUFACTURERS**

Telephone . . . 240 Clydebank

Telegrams . . . Beardmore, Dalmuir

SIR W.G. ARMSTRONG  
WHITWORTH & CO. LTD.

CONTRACTORS TO H.M. ADMIRALTY AND  
WAR OFFICE



AIRCRAFT-WORKS  
NEWCASTLE - ON - TYNE

TELEGRAMS  
ARMSTRONG AVIATION  
NEWCASTLE - ON - TYNE

TELEPHONE  
500. GOSFORTH



H. I. MAR  
ROSEVINGE





# **CELLON**

(NON-POISONOUS)

# **DOPE**

**CELLON LTD.,**  
**BROAD STREET HOUSE, E.C.2.**

TELEGRAMS—"AJAWB," LONDON

TELEPHONES—LONDON WALL, 5359, 3622,

Contractors to H.M. Government.



*Apollo* (REG)  
TUBULAR BOX-SPANNERS

TELEPHONE: OLD BURY III (4 LINES)

# ACCLES & POLLOCK, LIMITED.

OLDBURY, BIRMINGHAM.

TELEGRAMS: "ACCLES, OLD BURY"

155. 89. 61. 7. 78. 191

TRADE MARK  
"MEANS LONG LIFE."

AIRCRAFT COMPONENTS.



TAPERING  
BENDING  
NECKING  
CRANKING  
BRANCH PIPE  
LEVER  
PIN

## SEND FOR OUR LISTS

fully illustrated and explanatory  
of our various products.

### STEEL TUBING, STEEL PRESSWORK, TUBULAR BOX SPANNERS,

for Aircraft, Motor, Cycle and  
General Engineering Trades. We  
are Steel Tube Makers and  
Manipulators, and Steel Press-  
work Artificers.

We are anxious to distribute  
our Lists where

## THESE WILL BE OF SERVICE.

CYCLE,  
MOTOR CYCLE  
& PRESSWORK  
PARTS.



"APOLLO" MAJOR TAYLOR HANDLE BAR.  
No 50 FORWARD SEAT PILLAR  
No 100 BACK STAYS  
BOTTOM HEAD LUG  
BALL RACE SEALING  
BAYONET CHAPE  
SHOE FOR POLE  
CLIP  
HINGED CLIP  
MILITARY CYCLE CARRIER

WORKSHOP GARAGE  
AND  
PANNIER BAG TOOLS.



THE "APOLLO" FERRET TUBULAR BOX SPANNER.



SET No S.W. 10.  
TUBULAR BOX SPANNERS.

SET No M.C. 13.  
TUBULAR BOX SPANNERS.

TUBULAR BOX SPANNERS,  
THE NUT & KNUCKLE PRESERVERS.



THE "WEASEL" SPANNER.



NON-POISONOUS  
DOPE

TITANINE



THE  
BRITISH AEROPLANE  
VARNISH CO., LTD.  
166, PICCADILLY, LONDON, W.1

Telephone : . . . . . GERRARD 5312.  
Telegrams : TETRAFREE, FIDSV, LONDON.

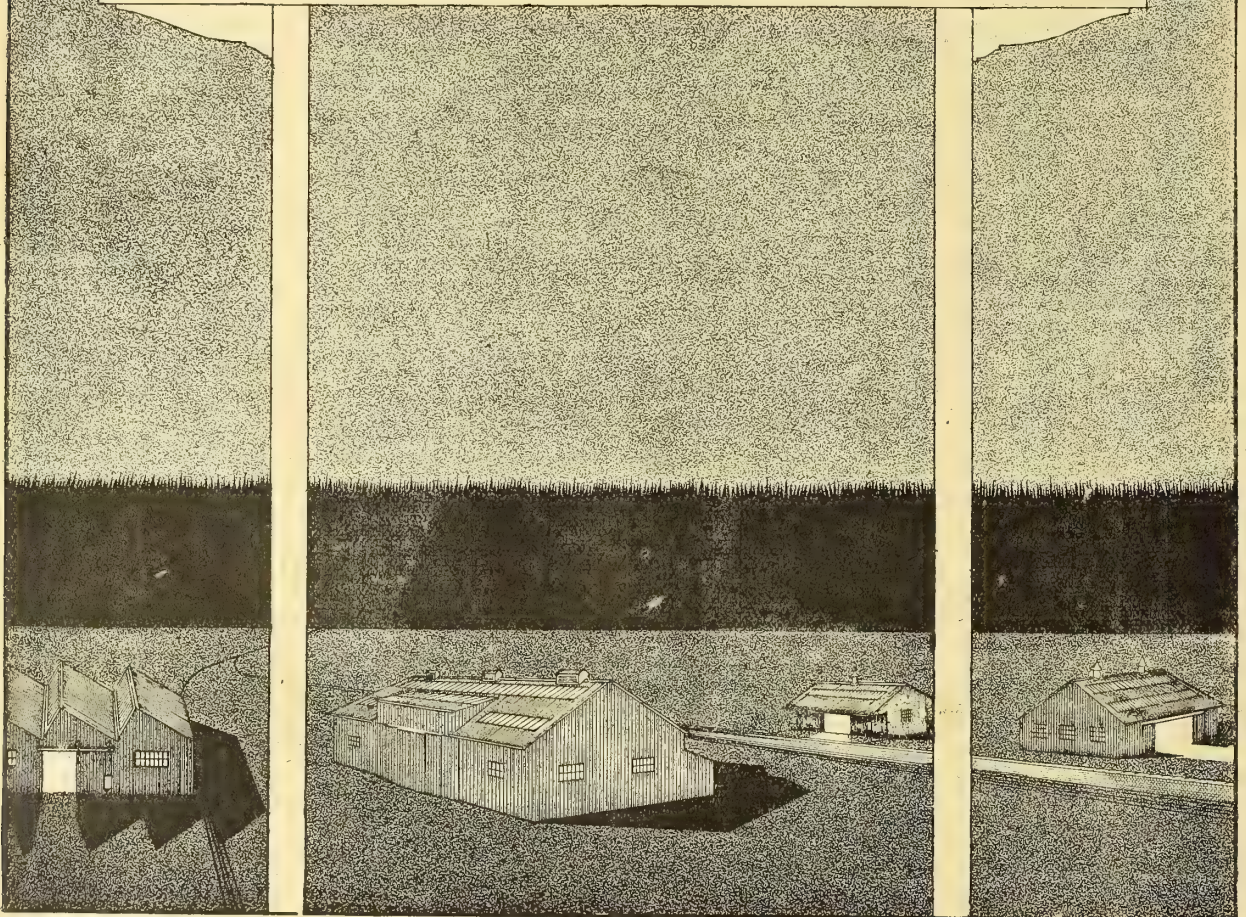
KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# WILFLEY STEEL BUILDINGS

TELEGRAMS. WRATHLESS PHONE LONDON.  
TELEPHONE. CITY 2681-2.

THE WILFLEY COMPANY LTD  
SALISBURY HOUSE  
LONDON, E.C.



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





is assured if you  
use Naylor's  
Superfine Products.

Write for Booklet describing  
Specialities for AERO WORK.

Our qualities include :

**AIRSCREW VARNISHES**

(Particulars of scheme approved by A.I.D., free on request.)

**Dope-resisting White Paints  
and Varnishes,**

**Seaplane Varnishes, Etc., Etc.**

And a variety of other approved Finishes.

Samples sent with pleasure.

**NAYLOR BROTHERS**

(LONDON), LTD.

Manufacturers of Superfine Varnishes,  
Paints, Enamels and Distempers,

**LONDON & SOUTHALL.**

Offices : 407 & 409, OXFORD ST., London, W.

Depot : 14, JAMES STREET, Oxford St., W.

**Established 117 Years.**

Contractors to all Government Departments.

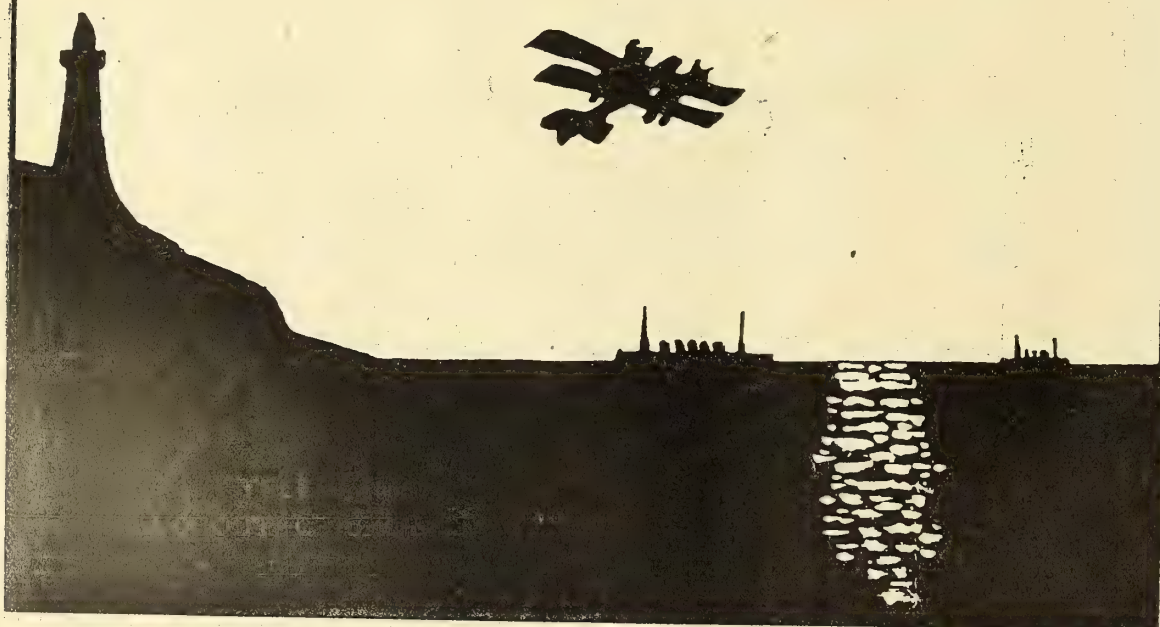
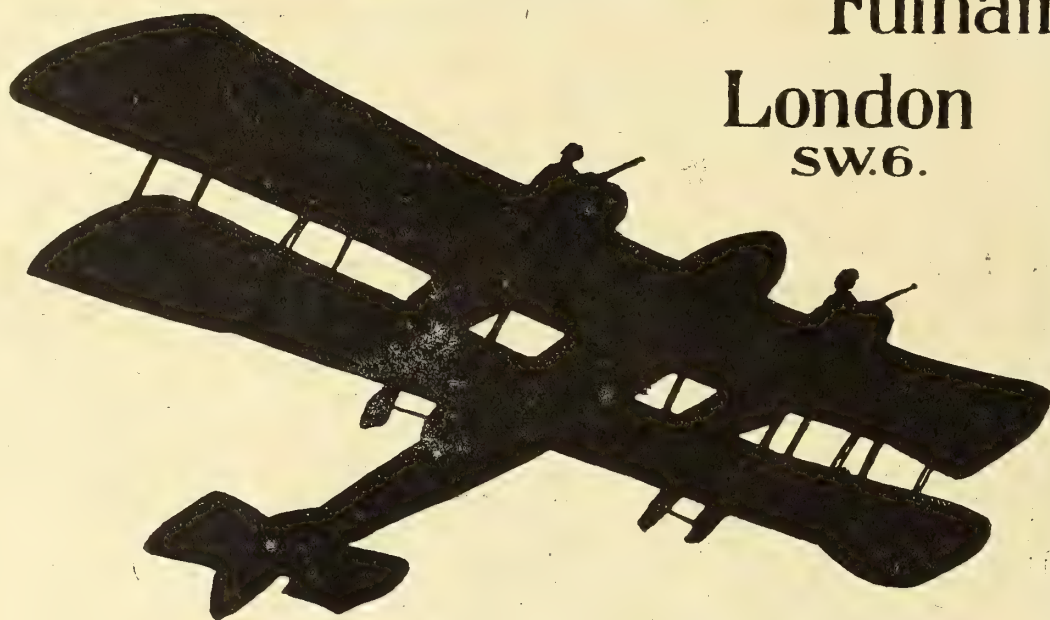


# THE REGENT

CARRIAGE CO<sup>LTD</sup>

Fulham

London  
SW.6.



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# **May we Cover and Dope your Wings?**

**AERO COVERINGS, LIMITED**  
**TENNYSON & WORKS**  
**WILLESDEN LANE**  
**KILBURN**  
**N.W.6.**

**Telephone :**  
**2202 Willesden**

**Acceptance and Experimental Flights—**

The Prodder Isaac Aviation Co. "Alromnia, Piccy, London." Gerrard 278 (2 lines).

**Acetylene Welding Plant—**

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.  
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

**Aeroplane Manufacturers—**

Aircraft Manufacturing Co., Ltd., Hendon. "Airmanship, Hyde, London." Kingsbury 180.

Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle-on-Tyne. "Armstrong Aviation, Newcastle-on-Tyne." Gosforth 500.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

British & Colonial Aeroplane Co., Ltd. (The Bristol Co.), Filton, Bristol. "Aviation, Bristol." Bristol 3906.

British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudron, Cricklewood, London." Hampstead 5551.

Central Aircraft Co., Palmerston Works, High Road, Kilburn, N.W.6. "Aviduction, Phone, London." Hampstead 4403 and 4404.

Davidson Aviation Co., Ltd., Hammersmith, W.6. "Hammersmith 1144-1145.

Eastbourne Aviation Co., Ltd., Eastbourne. "Aircraft, Eastbourne." Eastbourne 1176.

Graham-White Aviation Co., Ltd., London Aerodrome, Hendon. "Volplane, Hyde, London." Kingsbury 120.

Handley Page, Ltd., 110, Cricklewood Lane, N.W.2. "Hydraphid, Cricklewood, London." Hampstead 7420.

Mann, Egerton & Co., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Martinsyde, Ltd., Brooklands, Byfleet. "Martinsyde, Weybridge." Woking 331; Byfleet 171.

National Aircraft Co., Ltd., 15, Hackney Road, N.E.2. "Nieuport & General Aircraft Co., Cricklewood, London." N.W.2. "Nieuscout, Cricklewood, London." Willesden 2455.

Norman-Thompson Flight Co., Ltd., Bognor. "Soaring, Bognor." Bognor 48.

The Regent Carriage Co., Ltd., 126/132, New King's Road, Fulham, S.W.6. "Carbodis, London." Putney 2240-2241.

Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester." City 8530-8531, Manchester.

Saunders, S. E., Ltd., East Cowes, I.O.W. "Consuta, East Cowes." Cowes 193.

Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tested, Phone, London." Regent 378.

Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston." Kingston 744.

Standard Aircraft Manufacturing Co., Effingham House, Arundel Street, W.C.2. "Gunsigruish, Estrand, London." City 80.

Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickerlyta, Knights, London." Kensington 6810.

Waring & Gillow, Ltd., Hammersmith. "Warisen, Ox, London." Museum 5000.

Westland Aircraft Works, Yeovil. "Aircraft, Yeovil." Yeovil 129.

White, J. Samuel, & Co., Ltd., East Cowes. "White, East Cowes." Cowes 3.

Whitehead Aircraft (1917), Ltd., Richmond Surrey. "Whitcraft, Richmond, Surrey." Richmond 1865.

Wimbleton 1314.

**Airships—**

Airships, Ltd., High Street, Merton.

Short Bros., Rochester, Eastchurch, and Whitehall House, S.W. "Tested, Phone, London." Regent 378.

**Aluminium Castings (Sand & Die)**

Coan, R. W., 219, Goswell Road, London, E.C.1. "Krankases, Isling, London." City 2846.

**Bearings (Etonia Cast Phosphor Bronze)—**

Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds." Central 3027.

**Brass Sheets for Tipping Propellers—**

Pritt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fen, London." Avenue 995, 996, and 7906.

**Buildings—**

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

Palmer, T. W., & Co., Church Road, Merton Abbey, Surrey. "Wimbleton 1313.

Rubery Owen & Co., Darlaston, South Staffs. The Willey Co., Ltd., Salisbury House, London Wall, E.C.2. "Wrathless, Phone, London." City 2681-2.

**Cable Coverings and Cable Controls—**

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

**Capstan Work—**

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

**Carburettors—**

Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.1. Victoria 4670.

**Casein—**

Nieuwhof, Surie & Co., Ltd., 5, Lloyds Avenue London, E.C.3. "Surie don, Fen, London." Avenue 34 & 35.

**Castings—**

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

**Castings (Aluminium, Brass, Bronze, Machined or Rough)—**

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

**Celluloid (Non-Flam.)—**

Greenhill & Sons, 8, Water Lane, E.C. "Greenberg, London." Central 1306-7.

London Label Co., Beckton Road, E.16. "London Label, Canning, London." East 1300.

**Clothing—**

Burberry's, Ltd., Haymarket, S.W.1. Regent 2165.

Dunhill's Ltd., Euston Road, N.W.1. "Dunsend, London." North 3405-6.

**Component Parts—**

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines).

B. D. V. Aircraft Spares, Syon Chambers, 16a, Kew Road, Richmond, Surrey. "Aeros, Richmond." Richmond 1681.

Central Aircraft Co., Palmerston Works, High Rd., Kilburn, N.W.6. Hampstead, 4728.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

The Aircraft Construction Co., Harley Works, Beckton Road, E.16. "Aeracracons, Canning, London." East 1300.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

**Cords, Tapes, and Threads—**

MacLennan, J. & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.

**Dopes—**

British Aeroplane Varnish Co., Ltd., 166, Piccadilly, W.1. "Tetrafree, Piccy, London." Gerrard 2312.

British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellulute, London." Regent 4046.

The British Emallite Co., Ltd., 30, Regent Street, S.W.1. "Ridleyren, Piccy, London." Gerrard 280.

Celion, Ltd., Broad Street House, New Broad Street, E.C.2. "Ajawb, London." London Wall 3550-3622.

Clark, Robert, Ingham & Co., Ltd., Walter House, Bedford Street, Strand, W.C. "Pearline, Westrand." Regent 3923.

**Electrical Accessories—**

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207, London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Eus-road, London." Museum 70.

Premier Electric Heaters, Ltd., 258, 259, and 360, Bradford Street, Birmingham. "Fahrenheit, Birmingham." Midland 681.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

**Electric Cables—**

E. Kalker & Co., Coventry. "Kalker, Coventry." Coventry 24x.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207, London Wall 1564.

**Electric Lighting and Power—**

E Stanley Fardon, A.M.I.E.E., 67, Mosley Street, Manchester.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207, London Wall 1564.

**Engines and Parts—**

Allen, W. H., Son & Co., Ltd., Queen's Engineering Works, Bedford. "Pump, Bedford." Bedford No. 1.

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

The Beatty School of Flying, Ltd., The Broadway, Cricklewood, N.W.2. Hampstead 3000.

Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London." Gerrard 238.

Dudbridge Iron Works, Ltd. (Salmons), 87, Victoria Street, London S.W.1. "Aero-flight, Vic, London." Vic 7026.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

Gordon Watney & Co., Ltd., Weybridge. "Mercedès, Weybridge." Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham. Richmond 1203.

Gwynnes, Ltd., Hammersmith Iron Works, Hammersmith, W. "Gwynne, Hammersmith." Hammersmith 1010.

Napier & Son, D., Ltd., 14, New Burlington St., London, W., and at Acton, W. "Nitrifier, London." Gerrard 8926.

Robertson, J. H., & Co., 1, Albemarle Street, London, W.1. Regent 3906.

**THE AEROPLANE****Engines and Parts (continued)—**

Rolls-Royce, Ltd., 14 and 15, Conduit St., W.1. "Rollhead, London." Gerrard 1654-56.

The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. Regent 1181.

Sturtevant, B. F., Co., Ltd., Hyde Park, Boston, U.S.A.

Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorfield, Wolverhampton." Wolverhampton 085.

The Gnome & Le Rhône Engine Co., Ltd., 47, Victoria Street, S.W. "Elevenfold, London." Walthamstow 408 (2 lines).

**Flare Lights—**

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

**Flexible Shafts—**

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

**Flying Schools—**

Bournemouth Aviation Co., Ltd., Talbot Village, Bournemouth. "Etches, Winton." Bournemouth 1160.

**Furniture (Office)—**

Cooke's (Finsbury), Ltd., Finsbury Pavement House, London, E.C.2. London Wall 573 and 6179.

**Galvanising—**

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

The Rustless Iron (Cowper Coles Process), Ltd., 1, French St., Sunbury-on-Thames, Middlesex. Sunbury 37.

**Gears—**

Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham." East 407.

**Glue—**

Central Chemicals, Ltd., 283, West End Lane, London, N.W.6. "Entramical, Westham, London." N.W.6.

Improved Liquid Glues Co., Ltd., Gt. Hermitage Street, E. "Excroiden." Avenue 3178.

Wapp, London. "Excroiden." Avenue 3178.

Mendine Co., 8, Arthur Street, E.C. Bank 5873.

Oldroyd, Wm., & Sons, Ltd., 9, Mincing Lane, E.C.3.

**Goggles—**

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterflys, Piccy, London." Regent 1340.

**Heating and Ventilating—**

Chas. P. Kinnell & Co., Ltd., 65 & 65a Southwark Street, London, S.E.1. "Kinnell, London." Hop 372 (2 lines).

**Hollow Spars—**

McGruer Bentwood Hollow Spar Co., Commercial Wharf, Lambeth, S.E. "Gabrielson, Watloo, London." Hop 718.

Robert Young Construction Co., Ltd., Canonbury Works, Canonbury Street, Essex Rd., London, N.1.

**Instruments—**

British Wright Co., Ltd., 33, Chancery Lane, W.C.2. Holborn 1308.

**Instruments (Scientific, Altimeters, etc.)—**

The Cambridge Scientific Instrument Co., Ltd., Cambridge. "Instrument, Cambridge." Cambridge 642.

Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, Phone, London." Walthamstow 180.

**Machine Tools—**

Brewster & Co., 11, Queen Victoria Street, E.C.4. "Circumfuse, Cannon, London." City 768.

**Magneto Driving Pieces—**

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

**Magnetos—**

The M-L Magneto Syndicate, Ltd., Victoria Works, Coventry. "Corlton, Coventry." Coventry 1008-1009.

The British Lighting & Ignition Co., Ltd., 204, Tottenham Court Road, W.1. "Vicks-mag, Phone, London." Museum 430.

**Metal Manufacturers—**

Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 42-43.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

**Metals in General—**

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Samuel Mercer & Co., 198, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

Pritt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fen, London." Avenue 995, 996, and 7996.

**Metal Parts and Fittings—**

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

Aircraft Supplies Co., Ltd., Ascol House, 125, Long Acre, W.C.2. "Upcast, Rand, London." Gerrard 276 (2 lines).

Arnott & Harrison, Ltd., Hythe Road, Willesden Junction. Willesden 2207.

Bayliss, Jones & Bayliss, Ltd., Wolverhampton. (Bolts and Nuts.) Bayliss, Wolverhampton. Wolverhampton 1041.



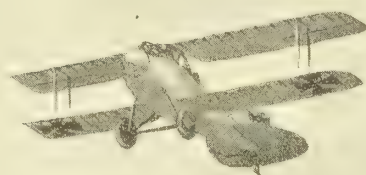




GOTHA



AVIATIK D.F.W.



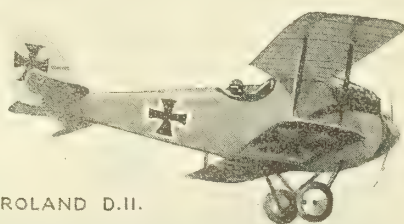
ALBATROS D.I.



FOKKER



ROLAND



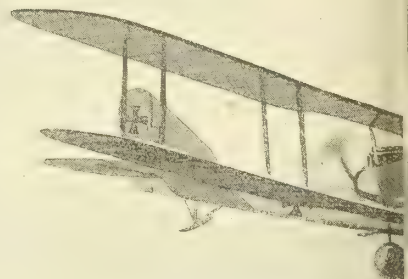
ROLAND D.II.



F.F.



HALBERSTADT

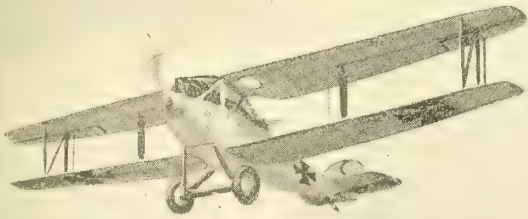


Representative Ener

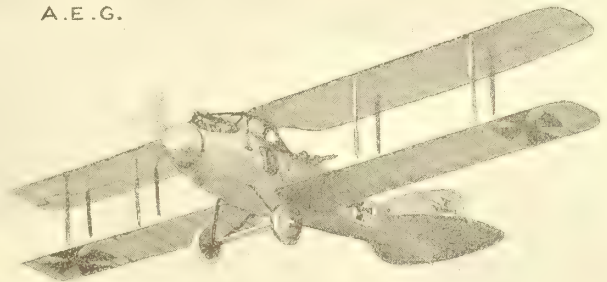




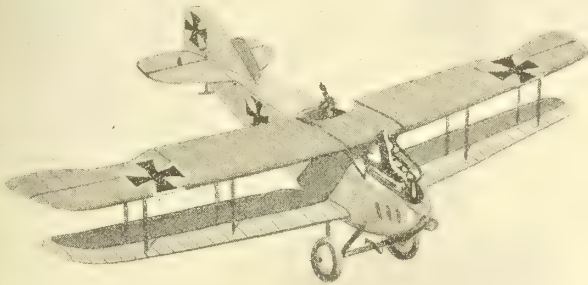
A.E.G.



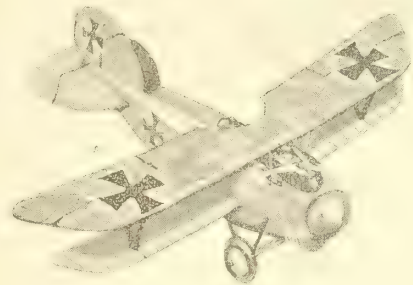
AGO



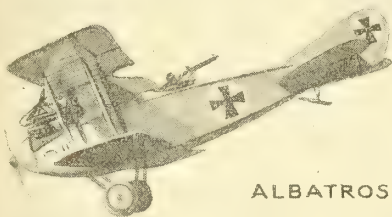
ALBATROS C.V.



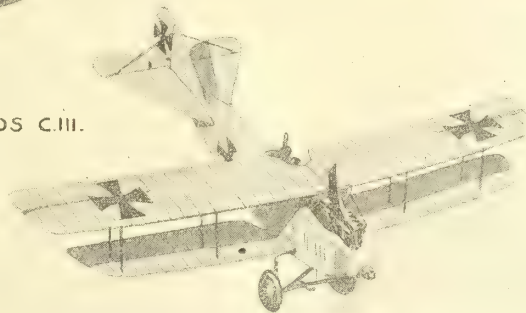
A.E.G. C.IV.



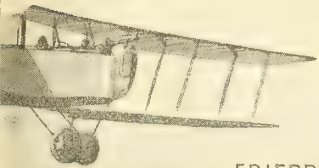
ALBATROS D.III.



ALBATROS C.III.



RUMPLER



FRIEDRICHSHAFEN

GEOFFREY WATSON

## Aeroplanes of 1917.







GOTHA



AVIATIK D.F.V.



FOKKER



ROLAND D.II.



HALBERSTADT



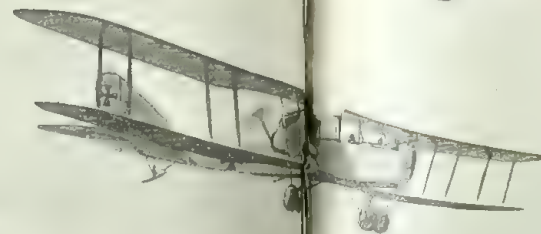
ALBATROS D.I.



ROLAND



F.F.



FRIEDRICHSHAFEN



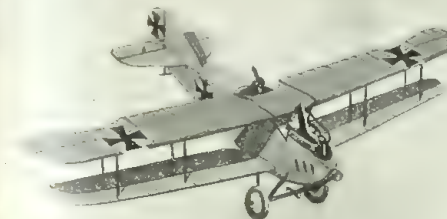
A.E.G.



A.G.O.



ALBATROS C.V.



A.E.G. C.IV.



ALBATROS D.III.



ALBATROS C.III.



RUMPLER

GEOFFREY WATSON

# Representative Enemy Aeroplanes of 1917.





# BUYERS' GUIDE

## Metal Parts and Fittings (contd.)—

The Birmingham Guild, Ltd., 45, Gt. Charles Street, Birmingham. "Handicraft."

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds."

Roundhay 345 (3 lines).  
The British Gold Shell Ring Co., Ltd., Inverness Road, Hounslow, London. "Golshell, Hounslow."

British Metal (Kingston), Ltd., Kingston-on-Thames. "Motors, Norwich."

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Eus-road, London."

Mountford, Fredk., Ltd., Fremo Works, Lifford, Birmingham. "Fremo, Birmingham."

Robertson, J. H., & Co., 1, Albemarle Street, London, W.1. Regent 3996.

Rubery, Owen & Co., Darlaston South Staffs. Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop."

The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. Regent 1181.

The Aircraft Construction Co., Harley Works, Beckton Road, E.16. "Aeracracons, Canning, London." East 1300.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London."

Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston." Bilston 10.

Wooler Engineering Co., Ltd., Old Oak Common Lane, Willesden Junction, N.W.10.

## Metal Shearing Tools—

Montgomery, Smith, & Co., Ltd., Tangent Works, Keynsham, near Bristol. "Ingeniuity, Saltford." Keynsham 21.

## Metal Spinnings—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Metric Bolts—

Cashmore Bros., Zota Works, Hildreth Street, Balham, S.W. Battersea 415.

Rubery Owen & Co., Darlaston, South Staffs.

## Miscellaneous—

Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast." Belfast 4033-4034-4035.

Anti-Glare Glass Co., Ltd., 76, Turmill Street, E.C. Central 3731.

Bowden Wire, Ltd., Willesden Junction, "Bowirelin, Harles, London." Willesden 2400 (3 lines).

British Metal (Kingston), Ltd., Kingston-on-Thames. "Motors, Norwich."

Brown Bros., Ltd., Great Eastern Street, E.C.1. "Imbrowned, Bethroad, London." London Wall 6900.

Endolith Manufacturing Co., Ltd., 614, Fore Street, London, E.C.2. Labels in Metal, Ivory, Ivoire, etc.

Herbert Frood Co., Ltd., Chapel-en-le-Frith. "Froodbrake, Birmingham." Central 793.

Glasso Manufacturing Co., Ltd., 211, City Road, E.C. City 9558.

London Label Co., Ltd., Harley Works, Beckton Road, E.16. "Nonflamoid" Nonflammable Celluloid. "Lonlabel, Canning, London." East 1300.

MacLennan, J., & Co., 30, Newgate Street, E.C.1, and at Glasgow. Tapes, Cords and Threads. City 3115.

## Motor Cars—

Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

Mann, Egerton & Co., Ltd., 379/381, Euston Road, London, N.W.1. "Manegecar, Eus-road, London." Museum 70.

Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 530 (4 lines).

## Nameplates and Labels—

British Metal (Kingston), Ltd., Kingston-on-Thames. "Motors, Norwich."

Endolith Manufacturing Co., Ltd., 614, Fore Street, London, E.C.2.

The Clegg Metal Engraving Co., Chatsworth Works, Worthing. "Clegg Worthing."

## Observation Panels—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlyps, Piccy, London." Regent 1340.

## Parachutes—

E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemalivo, Ave, London." London Wall 3266-3267.

## Pattern Making—

Fredk. Ward, 6, 7 and 8, Allsop Street, Upper Baker Street, W. Padd 4743.

## Piston Rings—

British Chuck & Piston Ring Co., Coventry. "Rings, Coventry." Coventry 723.

## Power Presses and Dies—

Bliss, E. W., & Co., 2a, Pocock Street, Blackfriars Road, London, S.E.1. "Blissdon, London." Hop 4340.

## Presswork—

Rubery Owen & Co., Darlaston, South Staffs. Terry Herbert & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Propellers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds."

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames. "Ebora, Kingston." Kingston 672.

Integral Propeller Co., Ltd., "Avipro, Hyde, London." Hendon 9. Kingsbury 104.

Lang Propeller, Ltd., Weybridge. "Aerosticks, Weybridge." Weybridge 520-521.

Mann, Egerton & Co., Ltd., Aircraft Works, Norwich. "Motors, Norwich."

Oddy, W. D., & Co., Leeds. "Aircscrews, Leeds." Central 291, Leeds.

Stanley Aviation Co., 67, Kingsland Road, E.2. City 8347.

Westland Aircraft Works, Yeovil. "Aircraft, Yeovil." Yeovil 129.

## Pyrometers—

The Foster Instrument Co., Letchworth, Herts. "Foster Instruments, Letchworth, Letchworth 26."

## Rigging for Aircraft—

Craddock, Geo., & Co., Ltd., Wakefield, England. "Craddock, Wakefield." Wakefield 466 (3 lines).

## Rubber Tubing & Accessories—

Hancock, James Lyne, Ltd., 266, Goswell Road, London, E.C.1. "Masticator, Isling, London." City 3811 and 3812.

## Safety Belts—

Holmes, C. H., & Son, 38, Albert Street, Manchester. "Semblon, Manchester." City 4432.

## Seaplane Manufacturers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds."

Mann, Egerton & Co., Ltd., Aircraft Works, Norwich. "Motors, Norwich."

The Norman Thompson Flight Co., Ltd., Middleton, Bognor. "Soaring, Bognor." Bognor 48.

Short Bros., Rochester. "Seaplanes, Rochester." Chatham 627.

Supermarine Aviation Co., Ltd., Southampton. "Supermarine, Southampton." Southampton 1337.

## Searchlights and Landing Lights—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

## Seats for Aeroplanes—

Bowser, E., Art Cane Works, 50 Park Lane, Leeds. Central 3473.

## Shackles—

The British Gold Shell Ring Co., Ltd., Inverness Road, Hounslow. "Golshell, Hounslow." Hounslow 254.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

## Sheet Metal Pressings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

Blackburn Aeroplane and Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds."

W. H. Briscoe & Co., Ltd., 51 and 52, Park Street, Birmingham. "Brisk, Bham." Central 550.

British Metal (Kingston), Ltd., Kingston-on-Thames. "Motors, Norwich."

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

London Aluminium Co., Ltd., Westwood Road, Aston, Birmingham. East 497 Birmingham.

Rubery Owen & Co., Darlaston, South Staffs. "Motors, Norwich."

## Sheet Metal Work—

British Metal (Kingston), Ltd., Kingston-on-Thames. "Motors, Norwich."

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Rubery Owen & Co., Darlaston, South Staffs. The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.

The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. Regent 1181.

Arthur Hall & Co., Silchester Road, North Kensington, W. Park 1443.

## Shock Absorbers (Elastic Cord)—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Sparking Plugs—

Lodge Sparking Plug Co., Ltd., Rugby. "Igniter, Rugby." Rugby 235.

Ripault, Leo, & Co., Ltd. (Oleo Plugs), 64a, Poland Street, W.1. "Ripault, Reg, London." Gerrard 7758.

## Springs—

Dart Spring Co., West Bromwich. "Dart, West Bromwich." West Bromwich 322.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61 (3 lines).

## Stampings—

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

## Steel—

Firth, Thos., & Sons, Sheffield. "Firth, Sheffield." Sheffield 3230 to 3237.

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

Nicklin, Bernard, & Co., Birmingham. "Bernico, Birmingham." Smithwick 224.

## Steel Tension Wires—

Craddock, Geo., & Co., Ltd., Wakefield, England. "Craddock, Wakefield." Wakefield 466.

## Steel Tubes for Aeroplanes—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

## Taper Pins—

Mountford, Fredk. (Birmingham), Ltd., Fremo Works, Lifford, Birmingham. "Fremo, Birmingham." King's Norton 261-262.

## Tapes and Smallwares—

Brown, Percy, & Co., 49, Newgate Street, London, E.C.1. "Ominate, Cent, London." City 4659.

MacLennan, John, & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.

James North Hardy & Son, Ltd., 54, Portland Street, Manchester. "Hudson, Manchester." Central 6471.

## Timber—

Engineering Timber Co., Ltd., 9, Victoria Street, London, S.W. "Entikossil, Vic, London." Victoria 5073, 4210.

Brown, R. F., & P. W., Wollaton Saw Mills, near Nottingham. "Brown's Saw Mills, Wollaton." Nottingham 1526.

J. Owen & Sons, Ltd., 199a, Borough High Street, S.E.1. "Bucheron, London." Victoria 1310.

## Time Recorders—

Gledhill-Brook Time Recorders, Ltd., 26, Victoria Street, S.W.1. Victoria 1310.

## Turnbuckles—

Rubery Owen & Co., Darlaston, South Staffs. "Tyres and Wheels—"

The Palmer Tyre, Ltd., Shaftesbury Avenue. "Tyricord, Westcent." Gerrard 1214 (5 lines).

## Undercarriages—

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

## Varnishes—

The British Emailite Co., Ltd., 30, Regent Street, S.W.1. "Ridleyphen, Piccy, London." Gerrard 280.

Clark, R. Ingham & Co., Walter House, Bedford Street, Strand, W.C. "Pearline, Westrand." Regent 3923.

Harland, W., & Son, Merton, London, S.W.19. "Harland, Wimbledon 45." Wimbledon 45 and 1395.

Naylor Bros., Ltd., Southall, Middlesex. "Naylor, Southall." Southall 30.

## Vices—

C. and J. Hampton, Ltd., Sheffield. "Vices, Sheffield." Attercliffe 95.

## Washers—

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Herbert Terry & Sons, Ltd. Redditch. "Springs, Redditch." Redditch 61.

## Watchmakers and Jewellers (Silver Models)—

Goldsmiths' & Silversmiths' Co., Ltd., 112, Regent Street, W.1. Gerrard 0091 (3 lines).

## Welding and Cutting Plant—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

## Welding Repairs—

Barinar, Ltd., 10, Poland Street, W.1. "Barigumar, Reg, London." Gerrard 8173.

The New Welding Co., 26, Rosebery Avenue, London, E.C.1. "Windoneeda, Holb, London." Holborn 5252.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

## Wind Shields—

Auster, Ltd., 133, Long Acre, W.C. "Win-flector, London." Regent 5910.

London Label Co., Ltd., Hadley Works, Beckton Road, E.16. "Nonflamoid" Nonflammable Celluloid. "Lonlabel, Canning, London." East 1300.

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlyps, Piccy, London." Regent 1340.

## Wire Gauze—

N. Greening & Sons, Ltd., 16, Finsbury St., London, E.C.2. "Setscrew, Finsquare, London." London Wall 1082.

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

## Wires and Cables (Aeroplanes)—

Bruntans, Musselburgh, Scotland. "Wiremill, Musselburgh." Musselburgh 28.

Craddock, Geo., & Co., Ltd., Wakefield, England. "Craddock, Wakefield." Wakefield 466 (3 lines).

## Wirework—

Terry Herbert & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Woodworking Machinery—

Robinson, Thomas, & Son, Ltd., Railway Works, Rochdale. "Robinson, Rochdale." Rochdale 467.

Sagar, J., & Co., Ltd., Halifax. "Sawtooth, Halifax." Halifax 126.

Wadkin & Co., Leicester. "Woodworker, Leicester." Leicester 126.



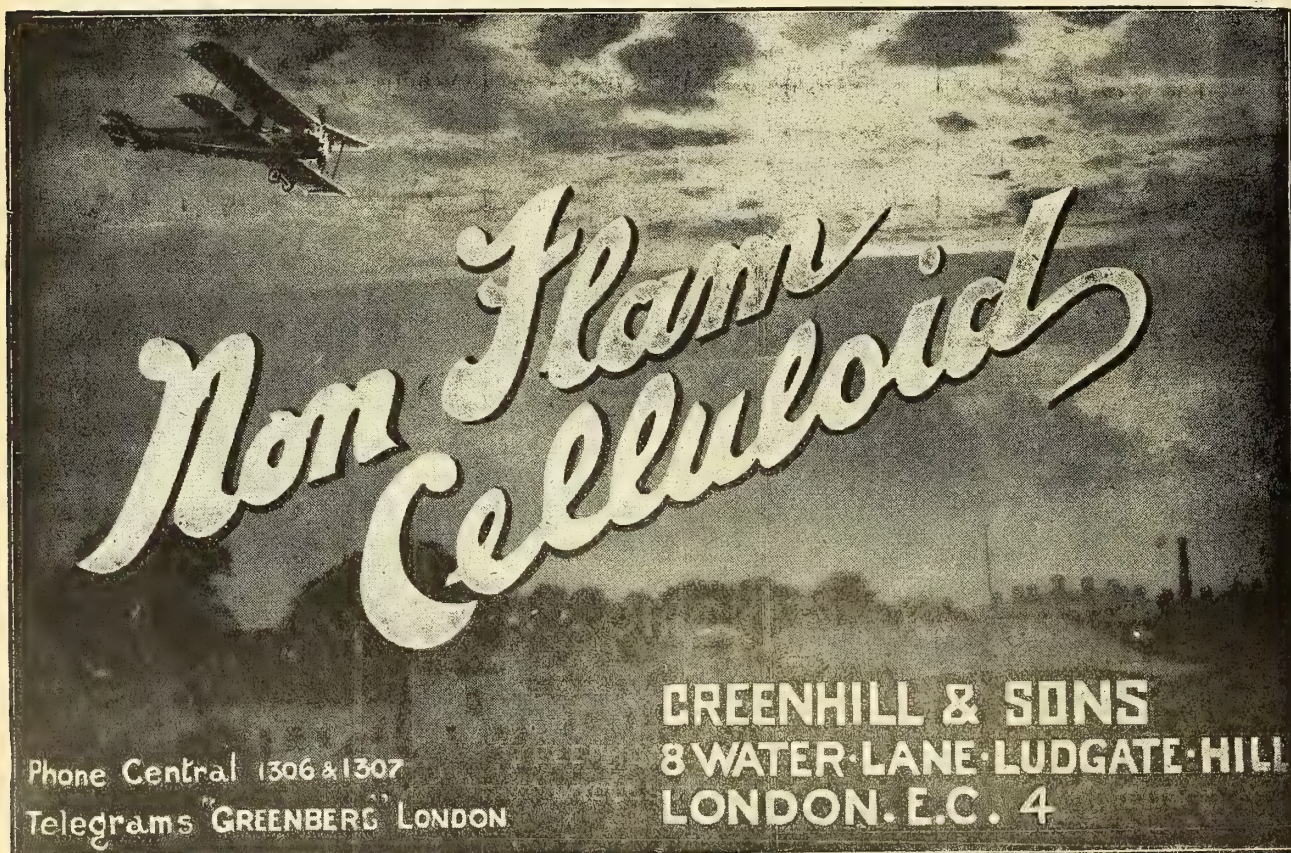
# **DELACOMBE, MARÉCHAL & HERVIEU** **LIMITED**

166, PICCADILLY, LONDON, W.1.

Telephone: 3031 Regent.

## **HANGARS FOR AIRSHIPS, AEROPLANES AND KITE BALLOONS**

CONTRACTORS TO THE  
ADMIRALTY & WAR OFFICE



*Non-Flammable  
Celluloid*

GREENHILL & SONS  
8 WATER LANE LUDGATE HILL  
LONDON. E.C. 4

Phone Central 1306 & 1307  
Telegrams "GREENBERG" LONDON

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



## WYCOMBE AIRCRAFT CONSTRUCTORS, Ltd.

HEAD OFFICE:

57, LONDON ROAD, HIGH WYCOMBE.

Telephone—HIGH WYCOMBE 84.

Telegrams—"AIRCRAFT, HIGH WYCOMBE."



STORES & RECEIVING OFFICE,  
HIGH STREET, HIGH WYCOMBE.  
Telephone.....HIGH WYCOMBE 120.

TIMBER YARD  
AND SAWMILLS  
OXFORD ROAD.



## NIEUPOORT

AND

### GENERAL AIRCRAFT COMPANY, L<sup>TD.</sup>

CONTRACTORS TO H.M. GOVERNMENT.

OFFICE AND WORKS—

LANGTON ROAD,  
CRICKLEWOOD, LONDON, N.W.2

TELEPHONE (3 LINES)—  
WILLESDEN 2455

TELEGRAMS—  
NIEUSCOUT, CRICKLE, LONDON

# WARING & GILLOW LTD

**CONTRACTORS  
TO THE  
WAR OFFICE AND ADMIRALTY.**

**LIVERPOOL      HAMMERSMITH      LANCASTER**



**HEAD OFFICE  
OXFORD STREET  
W.1**

**TELEPHONE No.:  
HAMMERSMITH 1980**

**TELEGRAMS:  
"Warings Factories, Hammersmith."**

## **Urgent Requirements.**

**STAFF.** SEVERAL FIRST-CLASS DRAUGHTSMEN.  
Good Salaries offered to competent and experienced men.  
No one at present engaged on Government work  
need apply.

**MATERIAL.** Offers required for the following:—

Tinned Steel Sheets, various gauges

Aluminium, do. do. do.

wood,  $\frac{1}{16}$ ",  $\frac{3}{16}$ ",  $\frac{1}{8}$ ",  $\frac{3}{8}$ ",  $\frac{1}{2}$ ",  $\frac{3}{4}$ ",  $\frac{1}{4}$ ",  $\frac{9}{16}$ "

Shackle Pins, 137 D.

AVRO Turnbuckles,

Types D. & F.



**THE GRAHAME-WHITE AVIATION CO., LTD.**  
**AERONAUTICAL ENGINEERS.**

## **NOTICE**

**To DeH.6. Contractors.**

We can supply *ex* STOCK  
BLANKINGS for all Metal Parts.

*Special developments of the following:—*

Parts Nos. 9485 }  
" " 9488 } Three blankings per set.

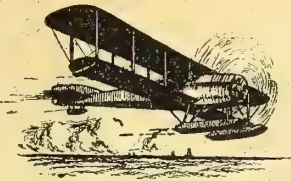
Telephone:—Kingsbury 120 (5 lines).

Telegrams:—Volplane, Hyde, London.

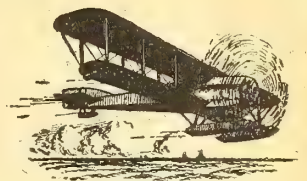
**THE LONDON AERODROME, HENDON, N.W.9**

Proprietors of the London Aerodrome and the Grahame-White School of Flying.





**JOSEPH EVANS & CO., LTD.**  
LIVERPOOL STREET MILLS,  
BIRMINGHAM.



Manufacturers of  
COMPONENT PARTS USED ON

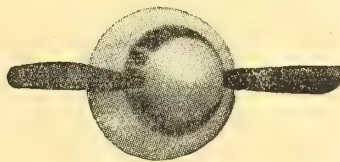
AERO ENGINES & AIRSHIPS.

**SHORT and FAIREY SEAPLANES.**

SPAD and H. FARMAN.

**D.H. MACHINES.**

SOPWITHS.



FLYING BOATS.

**AIRSCREWS.**

TELEPHONE: CENTRAL 733.

TELEGRAMS: "ADEPT, BIRMINGHAM."

**CONTRACTORS TO THE ADMIRALTY.**

Telegrams: "SUPERMARINE."

'Phone: WOOLSTON 37.

ESTABLISHED 1912.

# The Supermarine

## Aviation Works Ltd

Designers and constructors of Aircraft.

FLYING WATER & SLIPWAYS:

**WOOLSTON**

H SCOTT-PAINE, GENERAL MANAGER.



OFFICES & WORKS:

**SOUTHAMPTON**

ENGLAND.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

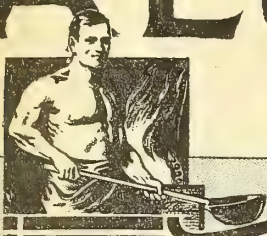


TELEGRAMS "AVIATION" NORWICH.

PHONE N° 851 NORWICH


**BOULTON AND PAUL LTD.**
**AIRCRAFT WORKS NORWICH**

# ALUMINIUM CASTINGS



SAND or DIE  
of Every Description  
2 HP to 600 HP

Telephones  
3846  
CITY  
4879  
CENTRAL

**CHILL CASTINGS for AEROPLANES A SPECIALITY**  
Best Metal. Good Castings. Quick Deliveries.  
*Repairs to Aluminium Crank Cases, Gear Boxes etc. by Special Process*

Telegrams  
"KRANKCASES"  
ISLING  
LONDON

## R.W. COAN

*The Aluminium Foundry*  
219, GOSWELL ROAD,  
LONDON,  
E.C.

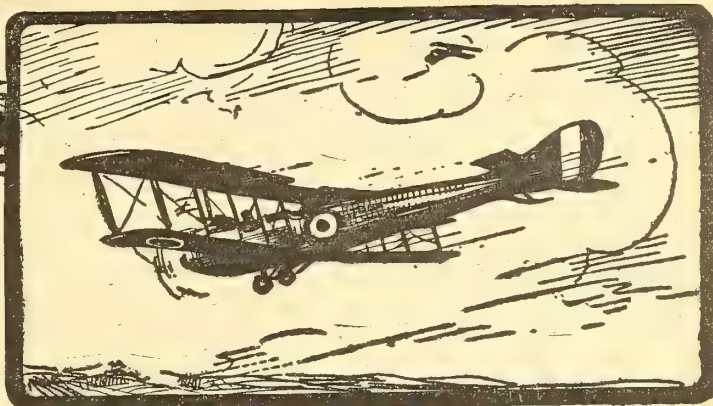
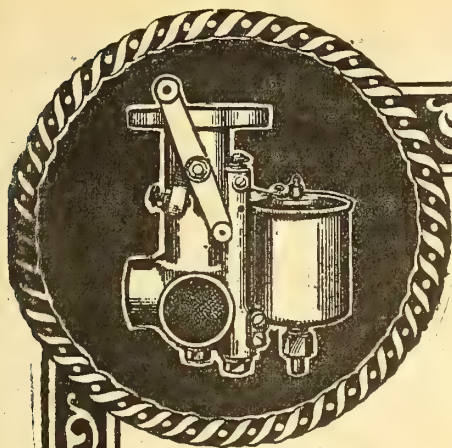
COAN  
CASTS  
CLEAN  
CRANK  
CASES

Contractor  
to  
H.M. GOVERNMENT

**NOW IN A POSITION TO EXECUTE ORDERS.**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





# ZENITH

## CARBURETTER

Send for  
Illustrated Booklet.

ZENITH CARBURETTER CO., LTD. 40-42 Newman St. LONDON, W.1.

Where swiftness,  
efficiency, and reli-  
ability are needed  
in the Government  
Service—there you  
will find the  
Zenith Carburetter

TEL. FORTY-ONE

# The London Aviation Co., LTD.

CONTRACTORS TO H.M. GOVERNMENT.

## Enquiries Solicited for Woodwork.

### Registered Offices:

27, CHARLOTTE STREET,  
E.C.2.

### Works:

28, CHARLOTTE STREET, E.C.2.  
NEW INN YARD, SHOREDITCH, E.C.2.  
126, GOSSETT ST., BETHNAL GREEN, E.C.

'Phone 7514 London Wall.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

Geo. Webster, Advertising Service.

# METAL COMPONENTS FOR AIRCRAFT

**THOMPSON BROS. (BILSTON), LTD.,**

SPECIALISE IN

METAL COMPONENTS FOR AIRCRAFT.

**UNDERCARRIAGES, TAIL UNITS, TUBULAR FRAMEWORK.****THOMPSON BROS. (BILSTON), LTD., AERO. DEPT., BILSTON, STAFFS.**

Telephone :—1992 HAMMERSMITH (3 lines).

*The*  
**DAVIDSON**  
*Aviation Co Ltd*

**CONTRACTORS TO H.M. GOVERNMENT.**

Designers and Manufacturers of all Types  
of Aircraft for Overland and Oversea  
- - Purposes, Flying Boats, etc. - -

Managing Director:

**W. EWART CHESTER, F.R.G.S.**

Consulting Engineer:

**H. B. MOLESWORTH, M.I.C.E.**

Aviation Works & Offices - 229-231, Hammersmith Road, W.  
Engineering Works - - King Street, Hammersmith.  
Airscrew Works - - Ravenscourt Park, W.



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



## IMPORTANT NOTICE

TO ALL

### Engineering Firms and Aircraft Manufacturers.

We beg to call your attention to the following work that we specialise in, and solicit your valued enquiries. We can quote prices and deliveries that will be attractive to you for all classes of work, or to any special specification and requirements for all work in connection with Ministry, Admiralty, or Air Board.

**DROP STAMPINGS & FORGINGS FOR ALL PURPOSES, IN STEEL OR IRON, BRASS OR BRONZE (HOT STAMPINGS).**

**SAND OR DIE CASTINGS IN ALL METALS.**

**SHEET METAL PRESSINGS.**

**SOFT GREY IRON CASTINGS; MALLEABLE IRON & CAST STEEL CASTINGS. WOOD WHEELS; AXLES; SWINGLE TREES; CHAIN WORK; LEATHER WORK, AND GENERAL IRON WORK FOR ALL TYPES GENERAL SERVICE VEHICLES.** Also

**COMPONENT PARTS in Steel Forgings or Stampings for Aeroplane Work, including A.G.S. No. 158 Shackles; Steel Stampings, sizes A, B, C, D, E & F.**

**THE ANGER MANUFACTURING & SUPPLY COMPANY, LTD.**  
**PRESTON, Lancashire.**

Telephone : 1033.

Telegrams : "Brakjuster, Preston."

# ALLDAYS



## FURNACES—GAS, OIL, COAL or COKE FIRED.

We make all kinds  
and for all purposes

The illustration shows  
three Twin-Chambered  
Coal Fired Case Hardening  
Furnaces we have  
recently installed in an  
Aeroplane Factory.

Send for particulars to—

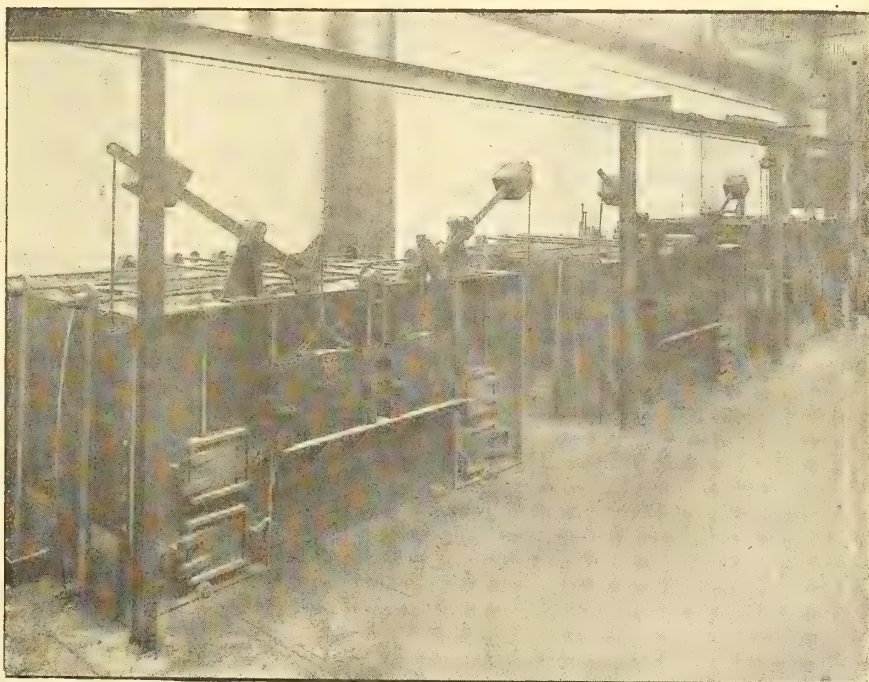
**ALLDAYS & ONIONS**

**PNEUMATIC ENGINEERING CO., LTD.,**

**Dept. KL, BIRMINGHAM**

and at

**58, HOLBORN VIADUCT  
LONDON, E.C.1.**



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





# Magnetos

*Smaller; Lighter;  
More Efficient.*

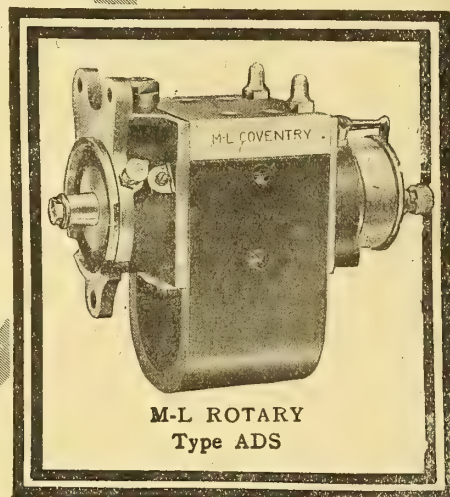
*All-  
British*

**M-L** Magnetos are of British design and built by British labour in a British owned factory. They have been supplied in large numbers for work of national importance. They are waterproof; always start easily and are efficient at the highest possible speeds.

The M-L Magneto, Type ADS, is designed for use on rotary or other engines in which the distributor is carried on the engine itself and does not form a part of the magneto. It is fitted with an "H" armature and gives two sparks per revolution.

*At Your Service  
after the War.*

The M-L Magneto Synd., Ltd.,  
Victoria Works - Coventry.  
Members of the British Ignition  
Apparatus Association.



M-L ROTARY  
Type ADS

## SAMUEL MERCER & CO.,

Telegrams: RECONCILED CANNON, LONDON.

Proprietor—S. J. MERCER.

Telephone: CITY 6342.

### Metals

MILD STEEL SHEETS  
SPECN. S3 & 9A.

Passed & Stamped A.I.D.

BEST CHARCOAL  
TINNED & LEAD  
COATED.

BLACK C/R and C/A  
SHEETS.

GALVD. SHEETS.

### Immediate

*Highest Prices given for*

198, UPPER THAMES ST., LONDON, E.C.4.



### for Aircraft.

BRASS AND COPPER  
SHEETS.

SOLDER. INGOTTIN.

WELDING WIRE.

COPPER BITS, ETC.

LARGE STOCKS IN OUR  
OWN WAREHOUSE.

### Deliveries.

*Brass and Copper Scrap.*



Telephones: DALSTON 872.

LONDON WALL 9766.

HAMPSTEAD 4768.

# Thames Aviation Works

(BURTON'S, LTD.)

TWO COMPLETE MILLS, PLANTS AND TWO YEARS' EXPERIENCE.

Erecting Shops and Saw Mills:

(Addresses may be had on application.)

Offices only: 141, CURTAIN ROAD, E.C.

CONSTRUCTORS OF COMPLETE AIRCRAFT

And all kinds of WOOD PARTS, WINGS, AILERONS,  
— STRUTS, LEVERS, RUDDERS, NACELLES, &c. —

Specialities—BIG STUFF and BEST WORK.

## "AERO" YARNS FOR AIRCRAFT FABRIC

Established 1800.



Looe Junction Mills near Bolton England.

We have the longest experience in the trade in spinning Special Superfine Combed Yarns for manufacturers of Aircraft Fabric. We do not belong to any ring or combine. 263,000 Spindles.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





Established 1897.

Manufacturers of Bowden Wire and of all  
Levers and Accessories used in its application.

Trade Marks and Names:

Bowdensolo  
Bowdenoir  
Bowdenamel

Bowdenite  
Bowdensilver  
Bowdenbrass

THE varied uses and adaptations  
of Bowden Wire Mechanism are  
recognised by almost every department  
of State Service. The War work  
which we have in hand precludes for  
the present our acceptance of private  
orders.

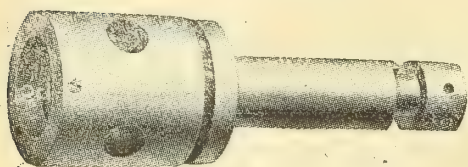
Victoria Road,  
Willesden Junction,  
London, N.W.10.

Godbold's

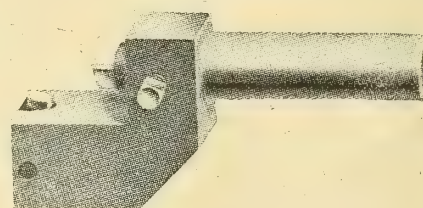
# CAPSTAN LATHE EQUIPMENT

For Machining of Strainers, Eyebolts,  
Fork Joints, Turnbuckles, etc., etc.

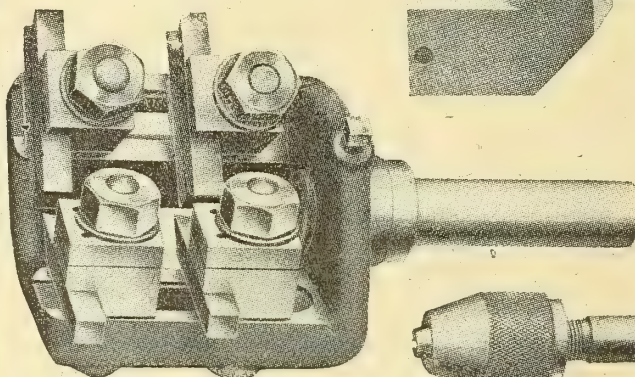
Self-releasing Die Holder.



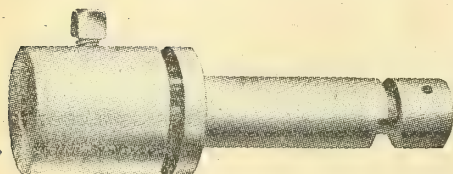
Knee Tool Holder.



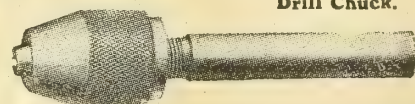
Box Tool Holder.



Self-releasing Tap Holder.



Drill Chuck.



SPRING COLLETS, HOLLOW MILL HOLDERS, FACE FORM TOOL HOLDERS, ADJUSTABLE STOPS, &c., &c.

IMMEDIATE DELIVERY.

**HENRY J. BREWSTER & Co.,**

11, QUEEN VICTORIA STREET, E.C.4.

Works: Goodmayes, Essex.

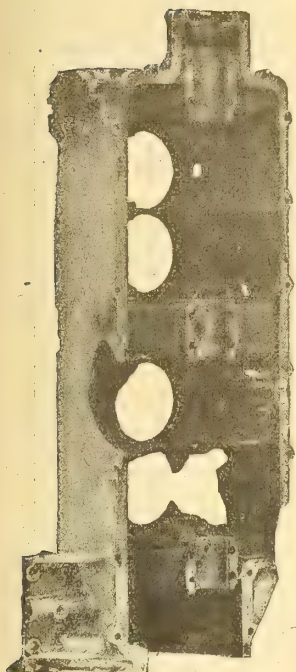
Phone: CITY 768.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



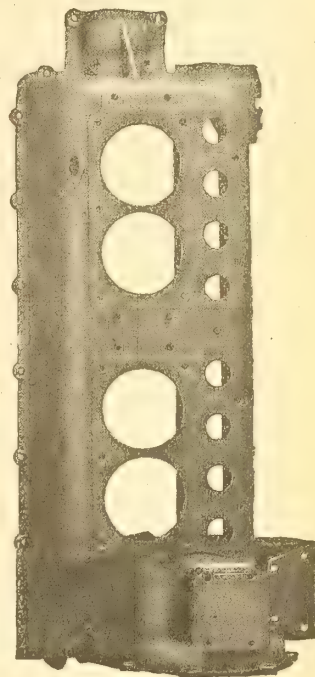
# THE NEW WELDING CO.'s

## Guaranteed Aluminium Crank Case Repairs.



A large badly damaged crank case, with several big pieces of metal broken right away and missing; numerous cracks and distortions added to the difficulties of the repair. Patterns were prepared of the missing pieces, and castings made, to

be afterwards welded into their required positions. The fractured parts were welded up, and the case finally machined and finished equal to new in every way; with this advantage, that the owner saved more than two-thirds in costs.



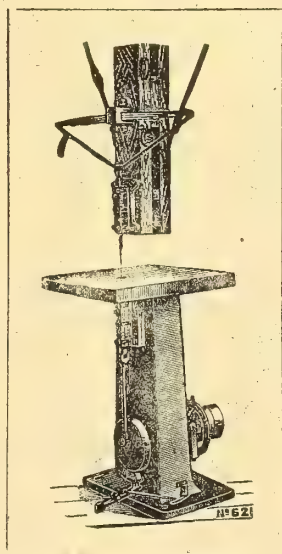
**The New Welding Co.,**  
26, Rosebery Avenue,  
LONDON, E.C.1.

'Phone : 5252 Holborn.

'Grams : "Windoneeda, Holb, London."

**SAGAR**

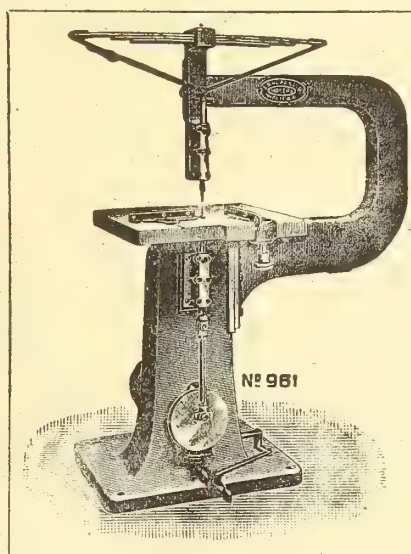
## FRET SAWING MACHINES Suitable for Aircraft Work.



'Made with Fixed or  
Canting Tables, and  
:: suitable Boring ::  
Apparatus if required.

Fuller particulars on  
request.

We make several other Wood  
Working Machines suitable for  
Aeroplane Builders, and shall be  
pleased to quote prices, etc., on  
receipt of enquiry.



**J. SAGAR & CO., Ltd.,** Sawmill Engineers, Canal Works, **HALIFAX, Eng.**  
LONDON OFFICE: 60, Watling Street, E.C.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



**HIGH-CLASS**  
**ALUMINIUM CASTINGS**  
**FOR ALL TRADES.**

We Specialise in Aluminium Cylinders and  
 General Aero and Motor Engine Castings.

**CAST IRON CYLINDERS**

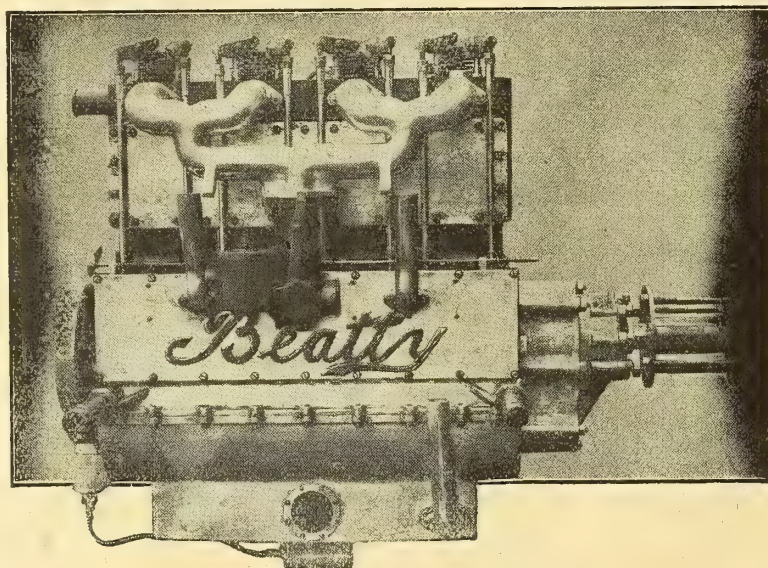
Water and Air-cooled for Aero and Motor Engines.

*All the above Castings to Government Specification.*

**WILLIAM MILLS, LTD.,**  
**Atlas Works, Grove Street, Birmingham.**  
**ALUMINIUM AND IRON FOUNDERS.**

**The Beatty Monobloc Aero Engine**

H.P. = 60.  
 R.P.M. = 1800  
 Engine Shaft.  
 Prop. speed =  
 1200 R.P.M.  
 Weight = 225 lbs



Petrol  
 Consumption  
 4.28 galls. per  
 hour.

Oil  
 Consumption  
 .18 galls. per  
 hour.

*Specially Designed and Developed for School Work.*

FULL PARTICULARS **The Beatty School of Flying Ltd.** LONDON AERODROME  
 Telephone . . . . Kingsbury 138.



WE CAN DELIVER

# A.G.S. Shackles 158

Sizes A and B ————— In any  
**QUANTITIES AT ONCE**

:: :: The ACTUAL Manufacturers :: ::

**The British Gold Shell Ring Co. Ltd.**  
**HOUNSLOW, MIDDLESEX.**

— Telegraphic Address —  
"GOLSHEL, HOUNSLOW."

— Telephone —  
HOUNSLOW 254

## ALUMINIUM CASTINGS

OF EVERY DESCRIPTION.

We make a  
Speciality  
of  
Aeronautical  
and  
Automobile  
Work.

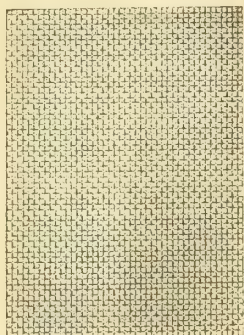
We are making many thousands of **Aluminium Die Castings** weekly under the celebrated **Cothias** process—in many cases **entirely eliminating** machining operations, and we hold the sole manufacturing rights in the British Empire for this process.

Chemical and Physical tests are made on our own premises, and our **Castings**, both **Sand** and **Die**, are produced under the most up-to-date and scientific methods.

Sole makers of the **Birmal Aluminium Pistons**, thousands of which are running to-day in a highly satisfactory manner under the most severe conditions.

Highest  
Class  
Castings to  
Government  
Specifications.  
Prompt  
Delivery.

**BIRMINGHAM ALUMINIUM CASTING (1903) CO., LD.**  
**Cambridge Street Works, BIRMINGHAM.**



## AIR BOARD STANDARD PETROL GAUZE.

WOVEN WIRE CLOTH  
IN ALL METALS AND  
IN ALL MESHES AND STRENGTHS.

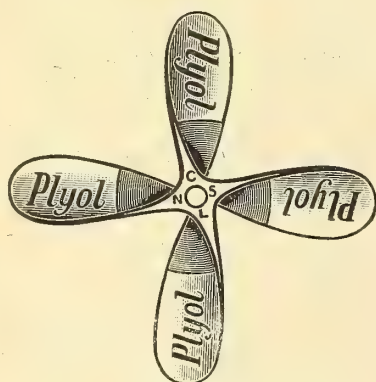
MANUFACTURED BY  
**N. GREENING & SONS, LTD.** ESTABLISHED 1799.  
LONDON WAREHOUSE—  
**16 FINSBURY STREET, E.C.2.**

Telegrams—"SETSCREW, FINSQUARE, LONDON."  
Telephone No.—LONDON WALL 1082.

**WORKS - WARRINGTON.**

## "PLYOL"

THE  
**BEST CEMENT**  
FOR  
**THREE-PLY,**  
Veneering, etc.



Registered Trade Mark.

## ALDGATE CASEIN WORKS.

**NIEUWHOF, SURIE & Co., Ltd.**

HEAD OFFICE:

**5, Lloyds Avenue, London, E.C. 3.**

Works:

**ALDGATE AVENUE, ALDGATE, E.C.**

Also Casein especially adapted for  
**Waterproof Paints, Varnish, etc.**

Telephones:  
AVENUE 34, 35.

Telegrams:  
"SURICODON, FEN LONDON."





**LACTOCOL**

**A.I.D.**

**APPROVED**

**COLD GLUE**

(Waterproof)

(Unaffected by Heat.)

1300 lbs. 1300 lbs.

Sq. INCH. Sq. INCH.

Lactocol Manufacturing Co.  
Laboratories & Works  
2a Studley Road  
CLAPHAM, LONDON, S.W.4.

Write for Sample.

TELEPHONE. BRIXTON 1443.

Contractors to H.M. Admiralty, War Office and Foreign Governments.

# The BRITISH CAUDRON

CO. LTD.

SOLE BUILDING AND SELLING RIGHTS FOR

**Caudron Aeroplanes  
and Hydro-Aeroplanes**

FOR

**THE BRITISH EMPIRE AND DEPENDENCIES**

Head Office and Works:

**BROADWAY, CRICKLEWOOD, N.W.2.**

Cable and Telegraphic Address: "CAUDROPLAN, CRICKLE, LONDON."

Phone: 4647  
4648 HAMFSTEAD

Scottish Factory and Aerodrome:

**ALLOA.**

Cable and Telegraphic Address: "CAUDROPLAN, ALLOA."

Phone: 52


KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



Firth's  
"Speedicut" High-Speed Steel  
For turning Tools.

"Speedicut" Milling Cutters  
and Drills  
For all workshop purposes.

Thos. Firth & Sons Ltd.,  
 Sheffield.



  
**Beardmore  
 Aero  
 Engine**  
*Ever in the Ascendency.*  
 THE BEARDMORE AERO ENGINE, LIMITED,  
 London Showrooms and Depots:  
 112, GT. PORTLAND STREET, LONDON; W.1.  
 Telephone: Gerrard 238.  
 C.D.C.



(Continued from page 186).

at the Royal Aircraft Factory in connection with the full-scale experimental work, which differs from those at the N.P.L., in that no distributor is used. The channel is located in a large airship shed, and no disturbance is caused at the intake due to the eddies from the airscrew. The same modification is applied in the channel at the Royal Naval Air Station at Kingsnorth, which has a section 6ft. (horizontal) by 4ft. In this case a four-bladed airscrew driven by a petrol motor is placed in the open air and the current is drawn through the channel from an airship shed. A speed of 100 miles per hour is attained.

A small wind channel was installed at the East London College in 1911, and is still in use for certain experiments. This has been replaced by a 4ft. channel, which is a copy of the National Physical Laboratory channels except that it is constructed of iron. The writer is indebted to Mr. Norman Piercy, who is in charge of the channel, for the following particulars. The balance differs from those at the N.P.L., the axis being horizontal, and includes one notably novel feature.

Considerable trouble had been experienced with the pivot upon which the balance of the earlier channel was supported, and at the suggestion of Professor Macgregor Morris this pivot was discarded in favour of a metal diaphragm whose plane is vertical, and to which the balance is rigidly attached. The diaphragm is bolted between two stout metal rings, the motion of the balance being resisted by the flexural rigidity of the diaphragm.

With the diaphragm at present in use the limit of sensitivity is about  $1/6000$ th of a pound. Greater sensitivity could be obtained by the use of a thinner diaphragm, but one objection to the method appears to be that the sensitivity cannot be readily changed in passing from one test to another.

The angle of incidence is varied by rotating the balance in a bearing the outer part of which constitutes the attachment to the diaphragm. The lift forces are measured by weights hung on the beam of the balance; the drag forces are transmitted by a horizontal bell crank to another bell crank whose plane is vertical, and upon the horizontal limb of which the measuring weights are hung.

The maximum velocity which can be attained at present is 50ft./sec., but sufficient power is provided to attain 90ft./sec. when the driving arrangements have been modified.

There are many other channels in use in this country, but the author believes that the more important of them are copied from those at the N.P.L.

#### THE CHANNELS OF THE NATIONAL PHYSICAL LABORATORY.

The first N.P.L. air channel was constructed in 1902. It was designed by Dr. G. E. Stanton, F.R.S., and used by him for the experiments on the air resistance of plane surfaces. This channel consisted of a vertical tube 2ft. in diameter, through which the air could be drawn downwards by a fan placed at its lower extremity. The air was delivered into the large engineering shop so that practically still air was continuously supplied at the intake of the channel. It is therefore not surprising that the

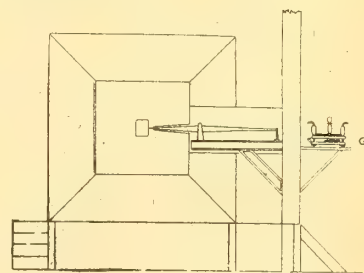
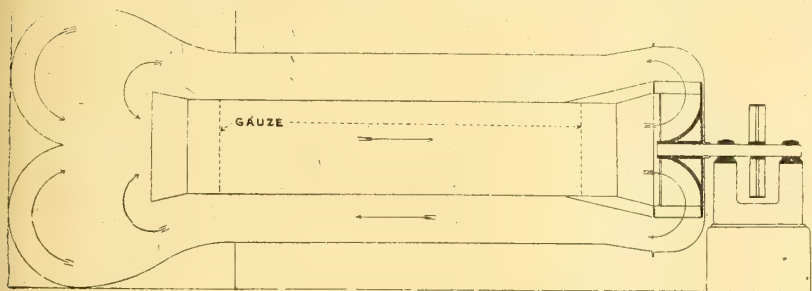
steadiness of the flow was comparable with that of the newer channels. A balance was provided for measurement of forces along the wind only.

For measurement of velocity Dr. Stanton devised a pitot and static head, of which the present laboratory standard is the outcome; the only essential difference is that, for convenience, the tubes are now concentric, instead of some two inches apart, as in the original form. Much useful work was carried out in this channel, and it is still in service at the present time.

The Advisory Committee for Aeronautics was formed in 1909, and an extensive programme of work was laid down. The need of additional apparatus was at once felt, and it was decided to erect a new channel. This channel had its axis horizontal, and is shown diagrammatically in Fig. 1. The total length was 20 ft. and the working channel, 4ft. square, was enclosed in a return channel 8ft. square. The air current was set up by a 6ft. Sirocco fan, driven by a belt from an electro motor, which drew the air through the working portion of the channel and delivered it to the return channel. Guide blades were provided at the fan outlet to correct the rotary motion of the air, and layers of wire gauze were introduced at the inlet to the test channel in order to improve the uniformity of the flow across a section. The velocity was measured by a pitot tube and Chattock tilting manometer, and reached a maximum value of 30ft./sec.

The balance was constructed in such a manner that simultaneous observations of lift and drag could be taken. The axis of the balance was horizontal, and for measurements of lift turned in ball bearings about a horizontal axis normal to its length. These bearings were carried in a fitting suspended on fine steel wires, allowing rotation of the balance through a small angle about a vertical axis for measurements of drag. The latter motion was transmitted to a right-angled bell crank whose plane was normal to that of the main balance arm. The horizontal limb of this bell crank constituted the drag beam upon which were placed weights to balance the wind forces. An oil dash-pot was provided which damped the oscillations of the two beams. One observer observed the reading of the drag beam and another regulated the speed of the air current and observed the reading of the lift beam.

This channel was in use till the year 1912, and the whole of the experiments carried out up to that date were made in it or in the 2ft. vertical channel. The 4ft. channel was not, however, entirely satisfactory, the flow being too unsteady to allow experiments to be carried out to the high order of accuracy which was desired. This result was mainly due to two causes; in the first place the fan was of the centrifugal type which is now known to be unsuitable for this purpose. There was found to be large pulsations in the pressure, a feature which appears to be common to fans of this kind. The second cause, which was of less importance, was that the air was returned to the intake of the channel in a disturbed condition.



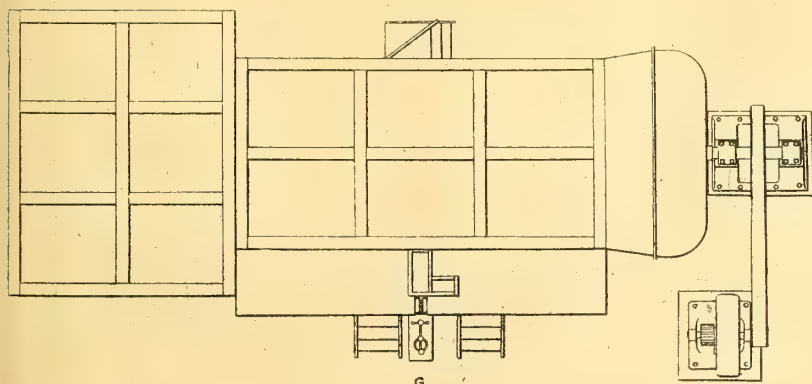
#### NATIONAL PHYSICAL LABORATORY.

##### EXPERIMENTAL AIR CHANNEL

1910

Fig. 1.

SCALE  
INCHES 1 2 3 4 5 6 7 8 9 10 FEET



It was accordingly decided to undertake a complete investigation into the conditions which affect the uniformity of the flow.

The design of the N.P.L. channels in their present form was based on these model experiments, of which an account is given in the 1912-13 Report of the Advisory Committee for Aeronautics. The success of the experiments may be judged from the fact that the latest of these channels was made almost an exact copy of the first, the only modifications being of minor importance, which were suggested by experience as likely to facilitate the taking of observations or to improve their accuracy. The criterion by which the merits of the various arrangements was judged was the nature of the variations of pressure difference in a pitot and static tube of the standard N.P.L. pattern. The pressure was recorded by a special form of photographic gauge which was constructed for these experiments.

The model experiments were carried out with a channel 6 in. square, and this model was finally placed in a scale model of a bay of the engineering laboratory in which it was proposed to locate the actual channel.

A very exhaustive series of experiments was made with these models, and the following conclusions were finally arrived at:— (1) The air current should be produced by an airscrew of low pitch. (2) The air leaving the fan should pass into a distributor slightly larger than the fan and from three to four diameters long. The air should escape from the distributor through tubes of appreciable length (actually about 1.2 in. in the 4 ft. channels), which should distribute the air over as large an area as possible in constant quantity per unit area. (3) The smallest building in which such a channel may be housed to give satisfactorily steady flow is one whose dimensions are 6 x 6 x 15 channel diameters.

#### THE MODERN TYPE OF CHANNEL.

The new (or No. 1) 4 ft. channel was constructed on these lines and is shown in Fig. 2. The channel, which has an overall length of about 54 ft., is placed in a building 60 ft. long, 50 ft. wide, with an average height of about 20 ft. This building was the existing engineering laboratory, and was larger than the size laid down by the model experiments. That size was, however, adhered to in constructing the 7 ft. channel, which was in view at the time the model experiments were being carried out. The No. 1 4 ft. channel is provided with a trumpet intake, and a honeycomb is placed in the parallel channel, A, near the entering end.

The air passes through this honeycomb to the balance, which is located in the parallel portion some 16 ft. from the intake. At the end of the parallel portion a metal expanding piece is fitted, in passing which the section is changed from square to round. The circular part of the channel is very short, being just sufficient to house the airscrew, B, which is driven by a long shaft from an electro motor supported on the wall at the end of the channel. The air is delivered from the fan into the distributor, C, from which it passes at low velocity to the room.

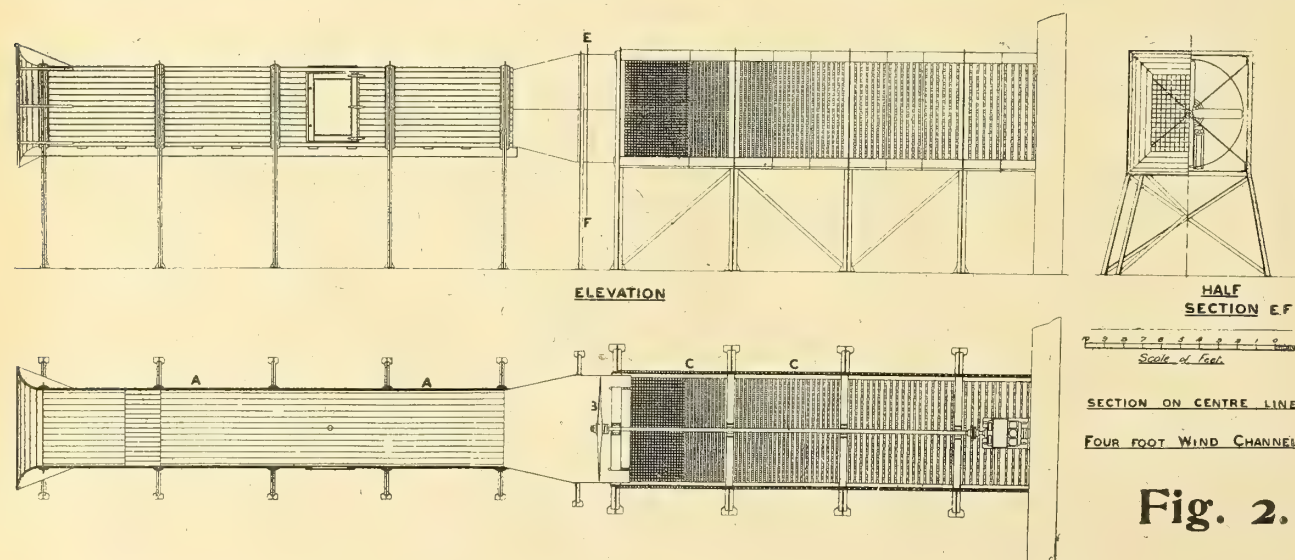
A glazed door is provided through which models may be introduced, and a trapdoor is fitted immediately over the balance.

The fan has four blades 6 in. wide, and is capable of producing a current of 50 ft. per second at 1,350 r.p.m. The power absorbed at this speed is 8 h.p., of which some 20 per cent. is lost in passing the honeycomb.

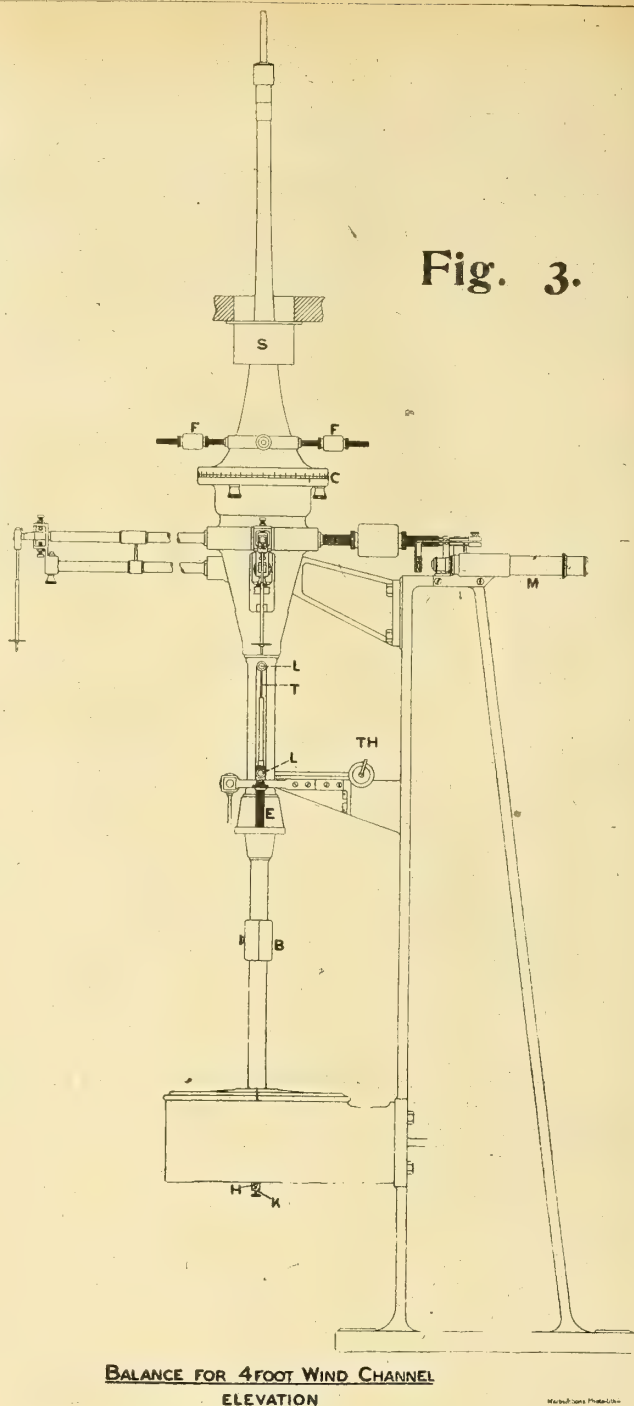
Regulating resistances are provided, and tests can be made at any wind speed from 20 to 50 ft./sec.

#### THE BALANCE.

The balance for the No. 1 4 ft. channel is of entirely different design from that of the original 4 ft., and is shown in Fig. 3:



**Fig. 3.**



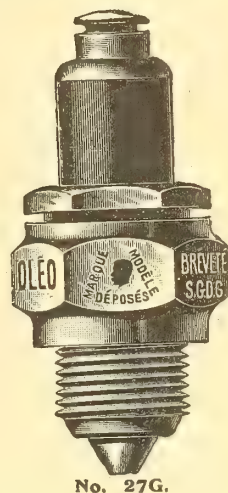


# Ripault's OLEO PLUGS

ARE SUPPLIED TO  
THE AIR MINISTRY  
MANY THOUSANDS  
:: EVERY WEEK. ::



No. 32.



No. 27G.

THE FIRST  
AERO PLUG  
USED BY THE  
BRITISH GOVERNMENT



No. 7.

THE FIRST  
AERO PLUG  
TO GAIN FAME

LEO. RIPAULT & Co., 64a, Poland Street, London, W.1.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

It was constructed with a view to carrying out the various complex experiments which were required as the study of the science progressed, and was arranged in such a manner that the interference of the supports with the model under test should be a minimum. Another difficulty was overcome which became more troublesome in the first balance as the size of the models increased, namely, the deflection of the balance, and airship models weighing about 30 lb. have been tested on the similar 7 ft. channel balance.

It is proposed to describe the first 4 ft. balance and to refer later to the changes which have been made in the more recent balances.

The balance consists of two main parts, the lower of which carries the weighing arms and moment apparatus, and the upper of which projects upwards through the floor of the channel and carries the model under test. The portion of the balance inside the channel is shielded from the wind by a guard, which covers also a portion of the spindle. This guard should not, however, be approached within about 3 in. of the model; in that position the interference due to it is usually negligible. The upper part of the balance can be turned upon the lower at C, and the model thus rotated through any desired angle about the vertical axis from outside the channel, and without stopping the wind.

The balance is supported on a single steel point resting in a hollow cone. This cone is rigidly fixed to a heavy casting, which is firmly bolted to a cement bed and is perfectly free from contact with the channel itself. The steel point is at the intersection of the centre lines of the two weighing arms, which are set along and normal to the wind direction.

The balance has three degrees of freedom, and is arranged in such a manner that moments can be measured about the centre line of each arm and about the vertical axis of the balance. Thus, referring to Fig. 3, the reader is looking along the wind direction, and the drag forces on the model will cause a moment about the axis of the lift beam,\* L, which is balanced by placing weights on the scale pan of the drag beam, D. In the same way a force across the wind causes a moment about the beam, D, which is balanced by placing weights on the scale pan of beam, L. A jockey weight is provided on each beam for fine adjustment. The third moment about a vertical axis was measured by means of the torsion of a wire, but this method has now been abandoned. There are two secondary arms placed diametrically opposite to the weighing arms, which carry balance weights, enabling the zero readings of the balance to be adjusted to values which will cover the range of forces to be measured.

The arm opposite the lift beam is held by means of a strut and C spring in such a position that the drag beam is accurately along the wind direction. This strut, the point on which the balance rests, the centre lines of the weighing arms, and the points of support of the two scale pans, are all in the same horizontal plane when the balance is in its mean position.

A movable weight, B, is provided for adjustment of the sensitivity, and additional weights can be placed on two studs, E, if necessary. A dash-pot is provided at the lower end of the balance, and there is a clamp by means of which the balance may be locked in its mean position while adjustments are being made or the balance is out of use. Balance weights, F, are also provided in the upper half, by means of which the centre of gravity of the model and the part which rotates with the model may be brought into the vertical axis, about which the balance is turned. This adjustment prevents change of the balance zero when the angle of the model is varied. To prevent a stream of air flowing into the channel where the balance enters it, an oil seal has been fixed, which does not in any way interfere with the freedom of motion of the balance.

A force along the vertical axis of the balance was measured on an additional beam on which rested a rod passing through the trumpet of the balance and supporting the model. This method has now been superseded by one which will be described later.

A somewhat unusual arrangement has been adopted for detecting the departure of the balance from its zero position of equilibrium. The method of setting two cross-wires into coincidence is unsatisfactory, as it is not possible to place the cross-wires close together on account of the allowance necessary for angular motion of the balance during the measurement of moments about a vertical axis.

Parallax is, however, avoided by attaching to the beam a mirror bearing a line, and near it, but on the balance support, a cross-wire. The line and the cross-wire should be parallel, and with the balance in its zero position the cross-wire is adjusted till the line is midway between the cross-wire and its image in the mirror. The vertical distance between the wire and its image may be altered by adjusting the position of the eye, and

\*This beam is called the lift beam from the common practice of supporting a model in such a manner that the lift forces act across the current.

BALANCE FOR 4 FT. WIND CHANNEL.

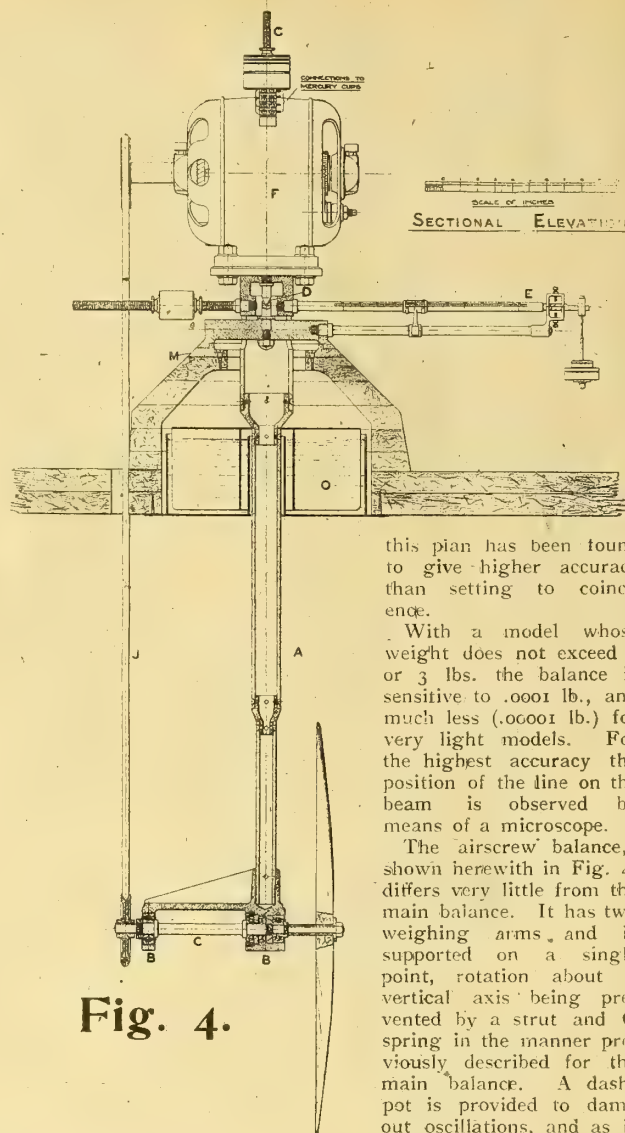


Fig. 4.

this plan has been found to give higher accuracy than setting to coincidence.

With a model whose weight does not exceed 2 or 3 lbs. the balance is sensitive to .0001 lb., and much less (.00001 lb.) for very light models. For the highest accuracy the position of the line on the beam is observed by means of a microscope.

The airscrew balance,\* shown herewith in Fig. 4, differs very little from the main balance. It has two weighing arms, and is supported on a single point, rotation about a vertical axis being prevented by a strut and C spring in the manner previously described for the main balance. A dash-pot is provided to damp out oscillations, and as it cannot be placed farther

from the point of support than the roof of the channel, it is made to serve also as an oil seal.

The speed of the airscrew is usually measured by electric signals from a toothed wheel driven from a worm on the airscrew shaft. In experiments in which it is important to maintain the speed at a predetermined value, the worm gear is replaced by a commutator which enables a certain number of electric contacts (the number can be varied at will) during each revolution.

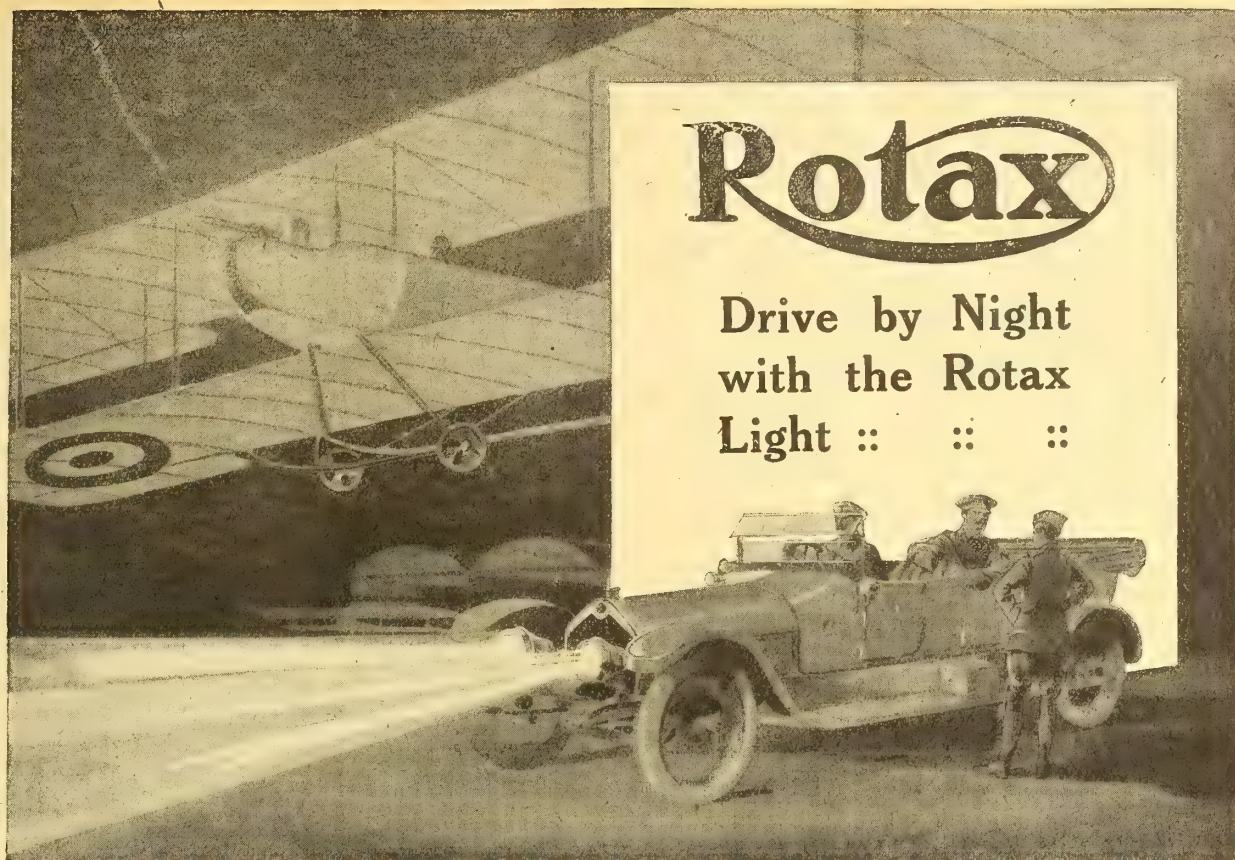
The pulsating current thus obtained is passed through an electrical frequency meter which gives an instantaneous indication of the speed at any convenient distance from the balance. An electro motor for driving the airscrew is carried on the upper part of the balance, current being supplied through mercury cups in order to leave the balance perfectly free. The airscrew is driven by a belt passing through a slot in the roof, which allows the whole balance to be turned through an angle of 40 deg. on either side of the position of symmetry. The arm, which projects downward into the channel, carries at its lower end ball bearings for the airscrew shaft, the axis of which is coincident with the centre line of the channel.

When the airscrew shaft is along the wind, the thrust is measured on the arm parallel to the wind and the torque on the one perpendicular to the wind. When the shaft is inclined to the wind, the thrust is still measured on the arm parallel to the airscrew shaft, but the arm perpendicular to the shaft measures the torque and the lateral force on the airscrew. These two quantities are determined from observations made when the model is inclined at equal angles on either side of the down-wind position. The torque will be given by the mean of the two readings and their difference will be equal to twice the lateral force.

(To be continued.)

\*Rp. Adv. Comm. for Aero., 1913-14, p. 291.





# Rotax

Drive by Night  
with the Rotax  
Light :: :: ::

## If it's ROTAX it's reliable

The saying has become as much an axiom with flying men as with motorists.

Just as the ROTAX DYNAMO LIGHTING (LEITNER) SYSTEM led to the universal recognition of Rotax Reliability—just as the ROTAX SELF-STARTER, on positive drive, establishes the same standard of ease, comfort, economy, and Reliability on whatever car it is tried—so

## Rotax Aircraft Fittings

are proving their Rotax Reliability in Works and Aerodromes up and down the country.

**ELECTRICAL APPARATUS.—BRASS AND GUNMETAL FILTERS,—STREAM-LINE WIRES AND FITTINGS.—FILTER TAPS AND SHACKLES, Etc.—PATENT AERO CLIPS.**

Any Manufacturer of Aeroplanes or Aero Engines who has not yet secured a copy of the Rotax Catalogue of the above Specialities should write us at once. In the words of many "it's a most handy little reference."

**THE ROTAX MOTOR ACCESSORIES CO., Ltd.**

HEAD OFFICES:

—ROTAX WORKS, WILLESDEN JUNCTION, LONDON, N.W. 10—  
P.C.B.5.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



## THE PATENTS INDEX.

The subjoined List of recent inventions has been specially compiled by THE AEROPLANE from the current Official Patents Records.

## PATENT APPLICATIONS.

- Aeronautical Instrument Co. Balloons. No. 18899. Dec. 20th.  
 Bennett, G. T. Gyroscopic direction indicators. No. 18840. Dec. 19th.  
 Bruce, R. A. Aircraft engines. No. 18854. Dec. 19th.  
 Corry, W. L. Method of causing a local rarefaction of the air and utilising same in aviation. No. 18714. Dec. 17th.  
 Davidson, J. A. Aviators' and motorists' outer garments, caps, mittens, helmets, etc. No. 18988. Dec. 21st.  
 Hucks, B. C. Aeroplanes. No. 18845. Dec. 19th.  
 Lanchester, F. W. Lateral plumb indicator for aeroplanes. No. 19015. Dec. 22nd.  
 Lanchester, F. W. Attachment of aeronautical propellers and bosses therefor. No. 19016. Dec. 22nd.  
 Maina, J. Aeroplanes. No. 18741. Dec. 17th.  
 Mooney, D. J. Metal spars for aircraft. No. 18921. Dec. 21st.  
 Munroe, J. M. Aircraft. No. 18942. Dec. 21st.  
 Munroe, J. M. Aircraft. No. 18943. Dec. 21st.  
 Nestler, F. C. Hangars for aeroplanes. No. 19026. Dec. 22nd.  
 Saunders, S. E. Aircraft of the heavier than air type. No. 18864.  
 Saunders, S. E. Airships. No. 18865. Dec. 19th.  
 Tarrant, W. G. Aeroplane wings or aerofoils. No. 18967. Dec. 21st.  
 Thomas, G. H. Aeroplanes. No. 18845. Dec. 19th.  
 Thompson, W. Method of launching aircraft from ships. No. 18955. Dec. 21st.  
 Thompson, W. Method of launching aeroplanes from ships. No. 18991. Dec. 22nd.  
 Wade, H. Wings of aeroplanes. No. 18982. Dec. 21st.  
 Wirtz, L. Safety devices for aeroplanes. No. 18936. Dec. 21st.  
 Wood, C. F. Flying machines. No. 19024. Dec. 22nd.  
 Ballantine, W. H. C. B. Balloons, dirigibles, airships, etc. No. 19179. Dec. 28th.  
 Boulton and Paul. Detachably-supported tanks, etc., on aircraft. No. 19215. Dec. 29th.  
 Boulton and Paul. Aeroplanes. No. 19273. Dec. 31st.  
 Boyle, E. Aeroplanes. No. 19085. Dec. 24th.  
 Calvert, G. Disabling aircraft, etc., driven by internal-combustion engines. No. 19286. Dec. 31st.  
 Duncan, T. S. Aeroplanes. No. 19142. Dec. 27th.  
 Garside, J. T. Apparatus for indicating lateral inclination of aeroplanes. No. 19160. Dec. 28th.  
 Goddevriendt, L. and A. Flying level-indicators. No. 19233. Dec. 29th.  
 Jameson, J. Means for indicating inclination of flying-machines, submarines, etc. No. 19198. Dec. 29th.  
 Jenkins, F. C. Bombs for dropping from aircraft. No. 19174. Dec. 28th.  
 Levi, H. Levels for aeroplanes, etc. No. 19154. Dec. 28th.  
 Oswin, W. Sparking-plug ignition-wire clip for rotary aero-engines, etc. No. 19123. Dec. 27th.  
 Payze, A. Aeroplanes. No. 19085. Dec. 24th.  
 Schryver, H. de. Device for mechanically regulating time and/or distance for explosion of aerial bombs. No. 19072. Dec. 24th.

COMPLETE SPECIFICATIONS ACCEPTED, PRINTS OF WHICH CAN BE OBTAINED ON AND AFTER JAN. 10th, 1918.

- 111,958. March 7th, 1917. Christianson, C. A. Aeroplanes, seaplanes, and like aircraft.  
 111,981. July 23rd, 1917. Smith, R. J. Device for destroying aircraft from a higher elevation than that of the enemy aircraft.

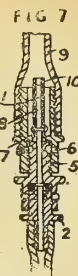
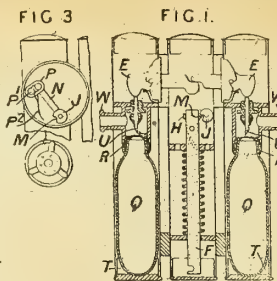
## ABRIDGMENTS OF RECENTLY PUBLISHED SPECIFICATIONS.

- 110,668 Life-saving, Marine; Buoys; Flying-machines. MULLER, J. P., 1, Rue Joseph Clerc, Le Havre, France.

An apparatus for automatically inflating life-saving collars, belts, buoys discharged from guns, etc., and also, in large forms, floats for supporting flying-machines on water, comprises a spring-actuated striker F adapted to pierce a compressed-gas container, but normally held inoperative by a projection H thereon engaging with a notch M in a spindle J carrying an external lever N which is maintained in position before immersion in the water by a ring of absorbent or soluble material P passing around a pin on the lever and a pin P<sup>1</sup> on the casing of the device. In the form shown, when the ring yields, the striker F actuates one or more pivoted hammers E and thus depresses devices U with perforated or grooved ends which puncture the reservoirs Q and allow the compressed air, etc., contained therein

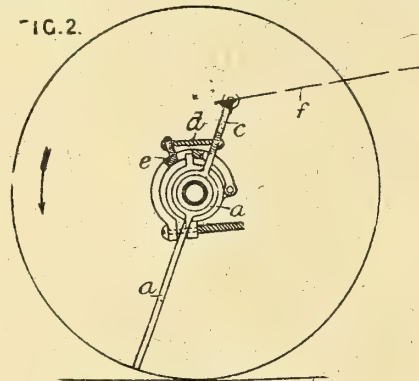
to pass through the tubes W to the inflatable devices. The reservoirs Q are held against rubber sleeves R by screwed or bayonet jointed caps T. A ring connected by wire or silk P<sup>2</sup> to the soluble device allows of this being ruptured by hand.

For protection against rain and spray, the device is carried in a leather, cloth, etc., cover which is attachable to the clothing, has a number of holes for the entrance of water, and is provided with a flap furnished with a press-button for detachably securing the ring attached to the wire, etc., P<sup>2</sup>. In a modification, the striker F is pressed downwards by its spring, and a lateral extension on it actuates the perforating device, of one or two reservoirs. In another form comprised in a single tube and for inflating collars, a downwardly pressed striker acts directly on the perforating device, a hook or clip is provided for securing the device on the clothing, and the absorbent is protected by a hinged cover carrying a valve at its upper end, and, at its lower end, a half tube which allows water to enter. The double-acting valve, Fig. 7, is connected to the inflating-device by a tube 2, and comprises a valve 5 with leather disk 7 and a hole 6 for inflating by the mouth, and a tube 8 perforated at 11 and covered with a rubber tube 10 which operates during automatic inflation, the air or gas passing through a tube 9 to the inflatable device. Three or four layers of paper known as "hydrophyle," of which the last layer is fixed by heat with rubber, are preferably employed for the absorbent ring P. Or the lever N may be retained by sugar, etc., which operates more slowly and allows of the use of the apparatus by persons diving to save others from drowning. When applied to flying-machines, a number of these devices are attached to the wings or fuselage, the inflatable chambers being enclosed in a wire or cord network.



- 110,534. Aeronautics. CONNOR, T. J., 26, Grange Street, Failsworth, near Manchester.

SKIDS.—A device intended to prevent forward tilting of flying-machines when on the ground comprises a member a pivotally mounted on the axle of a land wheel and formed with an extension c, which is connected by a cable d to the member e for applying the hand brake described in Specification 109,991, so that when the hand brake is applied, the member a is lowered into contact with the ground. The extension c is connected also by a cable f to the tail end of the fuselage with the intention

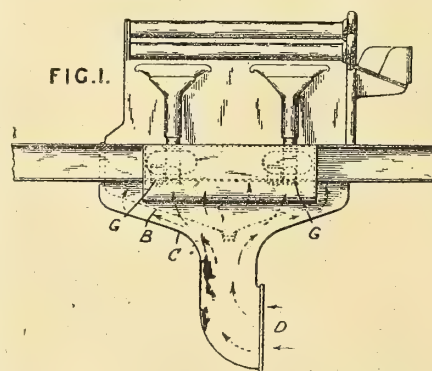


of communicating a downward pull thereto when the member a touches the ground. In a modification, the member a is pivoted to a landing-skid.

- 110,575. Internal-combustion engines. SUNBEAM MOTOR CAR CO. and COATALEN, L. Moorfield Works, Wolverhampton.

CRANK CHAMBERS, COOLING.—In engines intended more particularly for aircraft, the air supplied to the carburettors

G passes through a casing C which encloses the crank-chamber B, and may form part of the wall of the fuselage or gondola. The inlet D projects in the direction of motion and lies close to the tip of the propeller. Additional inlets which are not exposed to the forced draught may be provided.





# LODGE

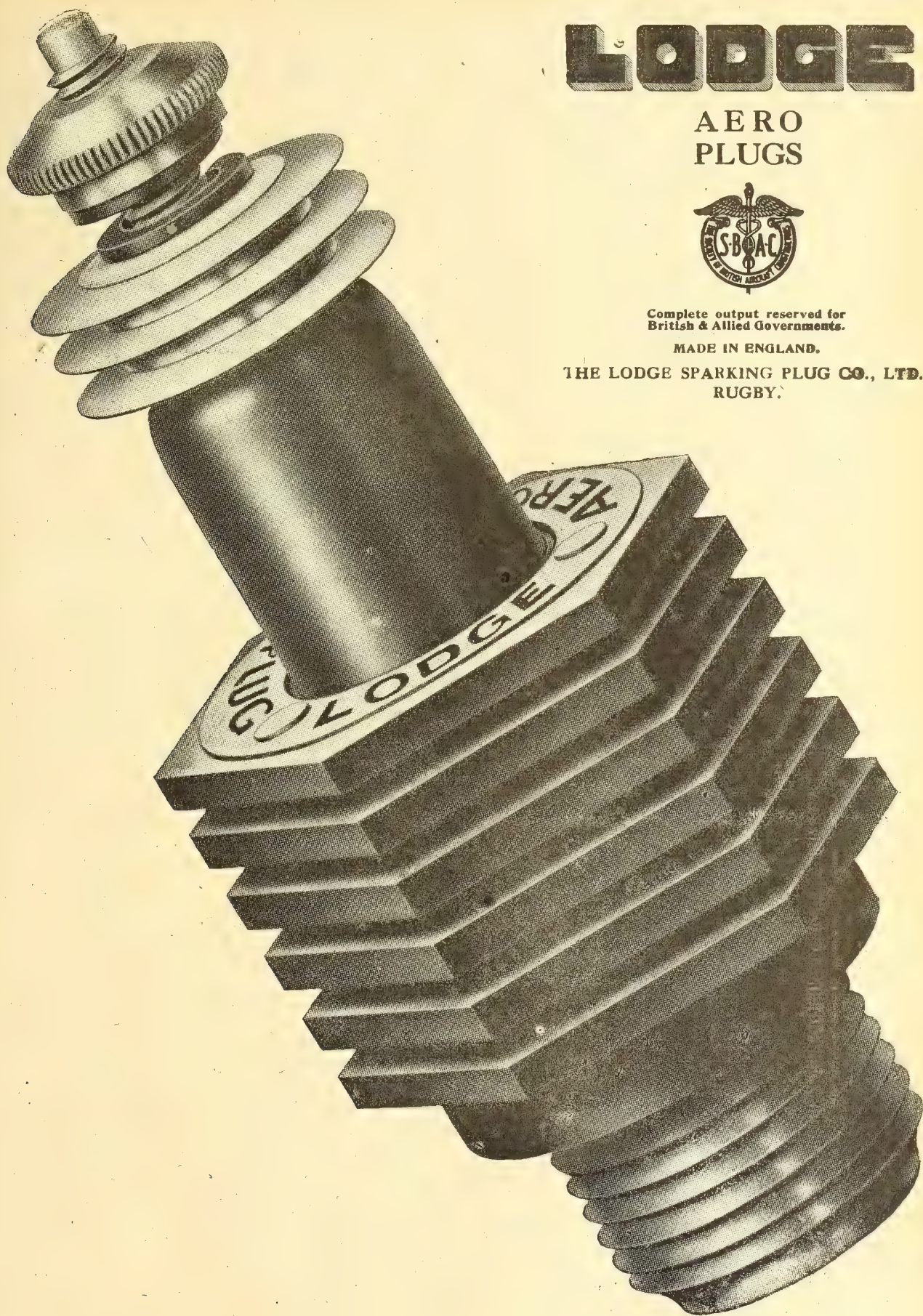
## AERO PLUGS



Complete output reserved for  
British & Allied Governments.

MADE IN ENGLAND.

THE LODGE SPARKING PLUG CO., LTD.,  
RUGBY.

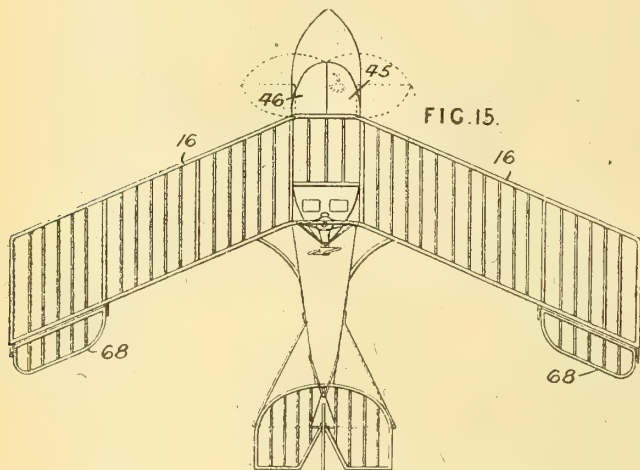


KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

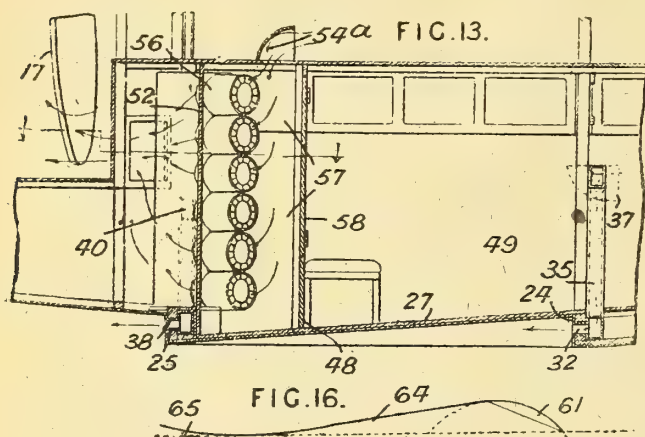


**110,562 Flying-boats.** BROOKE, T. P., 6,157, St. Lawrence Avenue, Chicago, U.S.A.

In a flying-boat or hydro-aeroplane comprising a streamline boatlike body with tail and having a totally enclosed motor arranged on an upright axis, the bottom of the body is formed with steps 24, 25, Fig. 13, having a transverse series of openings 32, 38, in the upright portions through which air issues under pressure to permit the boat to leave the water readily and to counteract the drag or suction at the steps while the machine is in flight. Wind-hoods 37 opening in the direction of flight conduct air through conduits 35, 40, to the steps, from which the



air flows in different horizontal planes. The boat bottom 27 is made flat between the steps, and is inclined upwardly in a forward direction. The forward part of the body is V-shaped, but merges into a flat nose. The cabin 49 is divided by a partition 48 into passenger and motor compartments, doors 58 in the partition giving access to the motor. The motor compartment is further subdivided by a partition 52 which isolates the cylinders 56 from the crank case so that a current of cooling air induced by the propeller 17, and admitted from open hoods 54a, passes through longitudinal passages 57 formed along the cylinders by fins or ribs cast thereon into the aft compartment, and thence to the

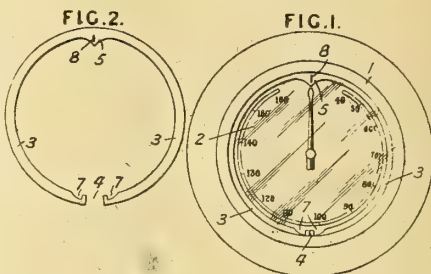


atmosphere in the path of the propeller at the rear. The front of the cabin is divided so as to swing open outwards on a vertical hinge at the front, as shown at 45, 46, Fig. 15. The wings 16 are disposed in rearward dihedral angles, and are built with rigid surfaces having the forward edges 61, Fig. 16, shaped to the arc of a circle, the middle part 64 straight and tangent to the circle, and the back part 65 curved upwards. The under surfaces of the wings have spaced parallel fins to minimise side-slip. The ailerons 68, Fig. 15, have counterbalanced pivoting and are curved to a continuation of the rear edges of the wings. The wings are of veneer construction in laminations of paper or other vibrous material and fabric glued together.

**110,614. Indicating.** AERONAUTICAL INSTRUMENT CO. and BREWER, G., 33, Chancery Lane, London.

Relates to manually adjustable zero-marks, or other particular-reading marks, for the scales and dials of measuring instruments

such as aneroid barometers, air-speed indicators, and magnetic compasses. A bezel 1, holding down the transparent glass cover 2, is provided with an undercut annular groove for the reception of an annulus 3 of elastic material such as vulcanite or thin sheet steel adapted to buckle when confined in the groove and thus retain its position. For this purpose, a gap 4 is cut in the annulus opposite to the zero or other mark 5 which it also bears, and the ends are formed with hooks 7 which are to be drawn together to facilitate removal of the annulus. Illumination of the mark is effected by cutting a radial slot through the material of, or a recess upon the surface of, the annulus, and fixing therein a glass tube 8 containing a radium compound.



### THE CLOSING OF AN AGENCY.

Mr. Edward Bowser, manufacturer of art cane work, of 50, Park Lane, Leeds, wishes it to be known that as the result of the unfortunate death of Mr. Harry Loveday, his London Representative, all correspondence and inquiries must now be addressed to the head office at Leeds.

### FROZEN CYLINDERS AND RADIATORS.

During the recent cold weather users of internal combustion engines in motor vehicles have experienced considerable trouble from the results of water freezing in the water-jackets of cylinders and in radiators, and the consequent leakages of these parts. In

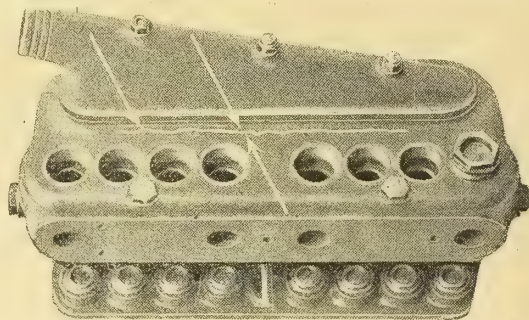


Fig. 1.—Four-cylinder Casting, fractured by frost, as indicated by the arrows.

this connection it should be noted that Barimar, Ltd., the well-known scientific welding specialists, have made special arrangements for dealing expeditiously with fractures due to frozen cylinders and radiators.

The accompanying photographs show how frost-cracked cylinders may effectively be repaired.

In order to secure prompt return of parts to be repaired, all fittings should be removed and the cylinders or radiators care-

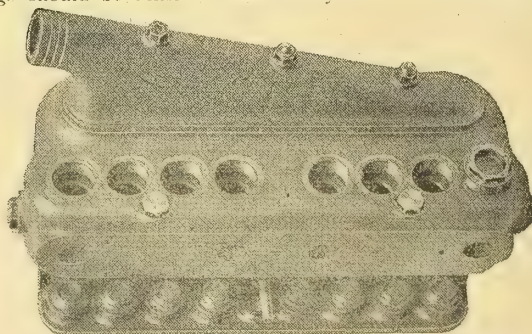


Fig. 2.—After Repair by Barimar Scientific Welding Experts.

fully packed and despatched per passenger train, addressed to Barimar, Ltd., Dept. BC., 10, Poland Street, Oxford Street, W.1. If portions of cylinders have been entirely detached by the burst, care should be taken to enclose the fragments.





**THE "HANDLEY-PAGE"**  
**BIPLANE**

using Rolls-Royce engines, made a

**WORLD'S RECORD  
LONG-DISTANCE  
FLIGHT**

**LONDON to ROME, CONSTANTINOPLE**  
and did its work lubricated with

**WAKEFIELD**

**Castrol**  
"R" **MOTOR OIL**  
(RACING).

**THE ONE OIL FOR ALL AERO ENGINES**  
**C. C. WAKEFIELD & Co. Ltd.**  
(Sir Charles Wakefield, Baronet,  
— Governing Director). —  
Wakefield House, Cheapside, London,  
E.C.2.

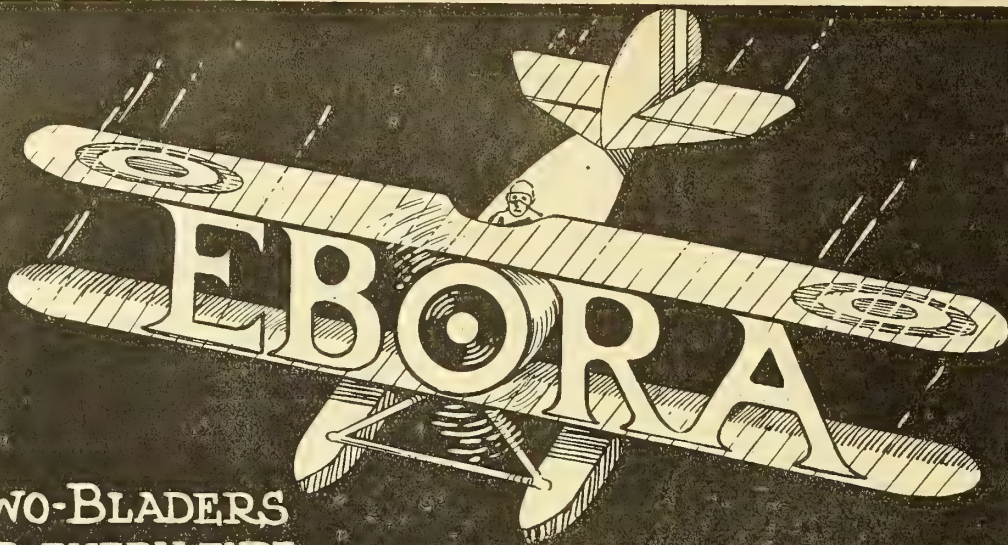


FREDERICK BROUGHTON

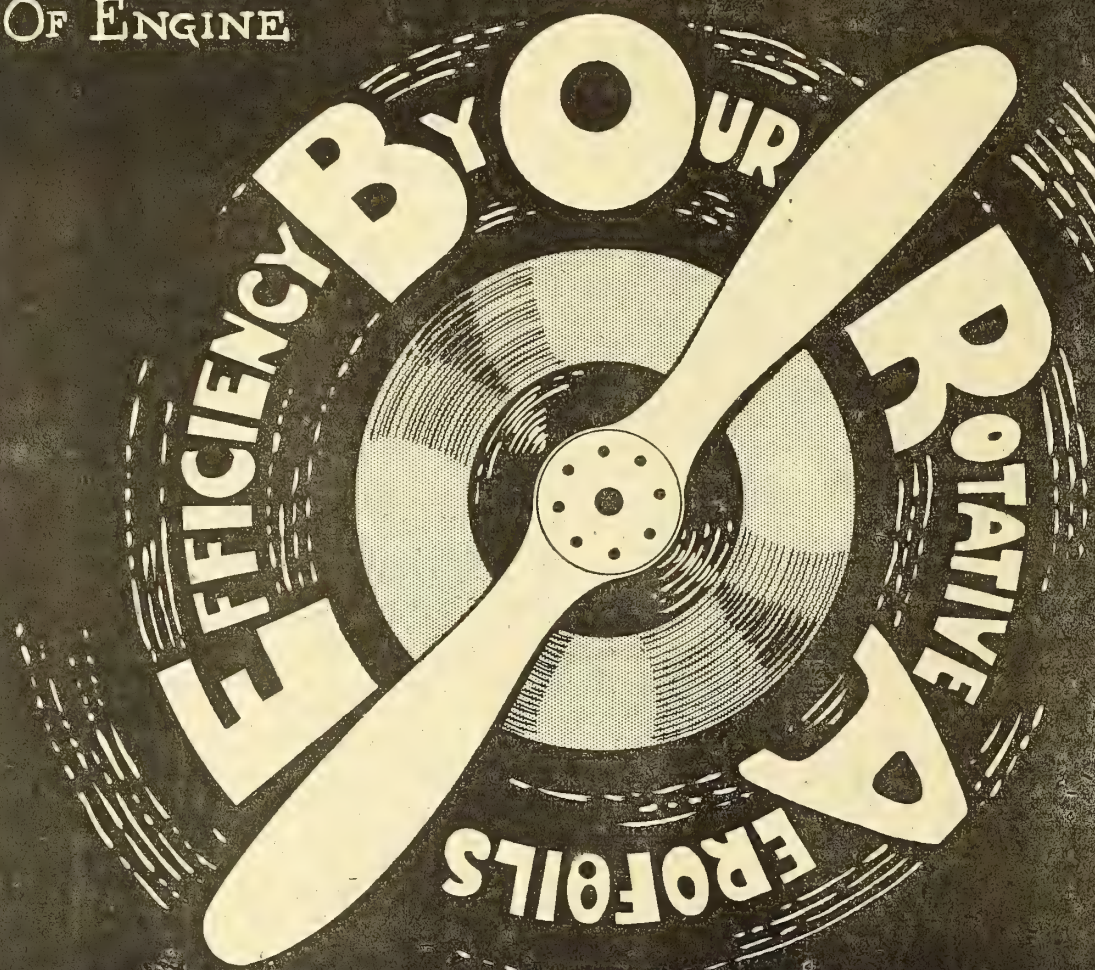
C.D.C.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





TWO-BLADERS  
FOR EVERY TYPE  
OF ENGINE



:: EBORA PROPELLER COMPANY, LIMITED, ::

Directors: Jan Schiere (Dutch), A.F.Ae.S. and Stewart Cole, F.C.A.

11 and 12 SURBITON PARK TERRACE, KINGSTON-ON-THAMES.

Tel-phone: Kingston 672.

Telegrams: "Ebora, Kingston."

CONTRACTORS TO H.M. ADMIRALTY AND WAR OFFICE.

DESIGNERS AND MANUFACTURERS OF AIRCRAFT PROPELLERS.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# AIRCRAFT FINANCE

## A RETROSPECT.

Considerable activity in Aircraft Finance has been witnessed during the past year, as is evidenced by the number of new aeroplane and kindred companies registered in 1917.

Except for a very few important incorporations the majority of new companies are private companies (i.e.), companies whose membership is strictly limited to fifty shareholders, and who make no appeal to the public for capital, the nominal capital of which is relatively small, ranging from £5,000 to £20,000.

A striking feature in connection with this Industry, as compared with the Ordinary Industrial Limited Company, is the fact that the nominal capital is no criterion of the importance of the undertaking. Many Aircraft companies enter into contracts involving in amount many times the whole of the nominal capital of the company.

The explanation is that the Government being the customer (in many instances the sole customer) is prepared to finance its own contracts, consequently, the producing company is not called upon to work solely with its own working capital, as is the case of industrial companies engaged in manufacturing or producing non-war commodities.

This does not necessarily mean that all such companies are thereby placed in a position to make profits out of proportion to their nominal capital, but definite information on this point is unobtainable, owing to the fact that "Private" limited companies do not disclose their accounts or file balance-sheets.

Sufficient indication on this interesting subject is, however, published by the official figures issued by the "Public" companies engaged in the Industry. For instance, one has only to compare the "Sales" with the "Net Profits" over a period of years given in the prospectus recently issued of one of the leading aeroplane companies, "The Aircraft Manufacturing Co., Ltd."

The following are the published figures:—

	Sales.	Net Profits.
	£	£
1913 .....	67,154	9,762
1914 .....	198,748	22,256
1915 .....	292,557	27,252
1916 .....	689,326	60,905
1917 .....	2,608,018	107,361

An analysis of the figures shows that the percentage of profit for the pre-war year amounted to roughly 14½ per cent., the percentage for 1914 was only 11½ per cent., and for the three war years, during which period the company was, presumably, engaged practically wholly upon Government work, the average in ratio of profit is very considerably reduced.

For 1915 the ratio works out at about 9½ per cent., for 1916 at about 8 4-5 per cent., and for 1917 it works out at only about 4½ per cent. Many may consider that this is as it should be, but it is a strong argument in favour of the views expressed by the Directors at companies' meetings recently held by several important companies that the Government is a hard taskmaster.

## PROSPECTUS ISSUES.

Public issues connected with the Industry have not been numerous during the period under review. The principal issues having been those of the Peter Hooker Company and the Aircraft Manufacturing Company.

In August last Peter Hooker, Limited, issued 250,000 7 per Cent. Cumulative Participating First Preference shares of £1 each, which were offered to the public, by the purchasers, at 21s. 6d. per share. These shares are entitled to a fixed dividend of 7 per cent. payable, free of income-tax up to 5s. in the £, and are further entitled to a participation in 25 per cent. of such surplus profits as are distributed among the shareholders in any year, up to a further 5 per cent. on the amount of the First Preference shares, such additional dividend being payable subject to tax.

The Aircraft Manufacturing Co., Ltd., made an issue of 250,000 7 per cent. Cumulative and Participating "B" Preference shares of £1 each, which were offered to the public at 21s. per share. These shares are entitled (subject to the dividend on the First Preference shares) to a fixed cumulative preferential dividend of 7 per cent. and to a participation of 20 per cent. of the amount by which the remaining profits, which it shall be determined to distribute in any year, shall exceed £5,000 (the amount of the fixed dividend on the Preferred Ordinary shares), provided that such participation shall not in any one year exceed an addi-

tional 7 per cent. The issue was oversubscribed, and these shares are now quoted at a premium.

## PRE-WAR AND PRESENT QUOTATIONS.

Interesting and instructive is a comparison of the following stock market quotations of some of the leading companies engaged in aircraft and kindred work:—

Quotation, July, 1914.	Present Quotation.
	s. d. s. d.
Sir W. G. Armstrong Whitworth & Co....Ordy.	40 0 ... 42 0
Vickers, Ltd. ....Ordy.	35 3 ... 42 6
Vickers, Ltd. ....5 per cent. Pref.	21 0 ... 18 0
Parent Tyre .....Ordy.	13 6 ... 25 0
A. Darracq & Co. (1905), Ltd. ....	26 3 ... 33 6
Rolls-Royce .....	28½ ... 31

## CURRENT TOPICS.

### COMPANY ANNOUNCEMENTS.

#### CROSSLEY MOTORS, LTD.

The ordinary General Meeting of Crossley Motors, Ltd., was held on Friday, Dec. 21st, Sir Kenneth Crossley, Bt. (the chairman), presiding.

After the Secretary had read the notice convening the meeting, the chairman said:—Gentlemen, as you have all had copies of the Directors' Report I presume we may take it as read. This is the first time we have had an annual meeting since we enlarged the number of our shareholders by an increase in capital—we were therefore in some doubt as to whether to provide accommodation for 5 or 500—fortunately we seem to have estimated your attendance with some accuracy.

#### NO ACCOUNTS PRESENTED.

It is a matter of regret to the Board that it is not yet possible to present the accounts for the year under review, but those of you who know something of the complications in connection with allowances and adjustments to be made under the Munitions and Finance Acts, will understand the delay and perhaps be grateful for the proposed dividend in the meantime.

I must however, give you some information with regard to your Company's activities during the past year. In the first place, all the anticipations put forward in the prospectus issued last February have been more than amply fulfilled.

#### O.H.M.S.

The works have been fully employed day and night for the British Government, and our output in cars and engines is constantly increasing every month.

You will be glad to know that we continue to receive excellent reports from all the chief centres of the war regarding the behaviour of Crossley cars. They seem to be equally reliable in the snow and mud of Flanders and on the deserts and rough tracks of Palestine, Mesopotamia and East Africa; in fact, wherever the Royal Flying Corps is established—from the Headquarters of the Ministry itself down to the farthest outpost overseas—there will our cars be found—ready and willing to do their duty at a moment's notice.

#### LOOKING AHEAD!

The experience gained under such varied circumstances will be invaluable to us after the war, and it is only reasonable to suppose that when we get back to normal conditions there will be a large demand for the "Crossley," which, in consequence of the enormous additions made to our factories, we shall be able to produce in very big quantities.

We are afraid of no reasonable competition, but like other British manufacturers, we are naturally anxious to know what is going to be the future fiscal policy of the country, so that we can lay out our programme in good time; we all recognise the impossibility of forming definite conclusions from doubtful premises, and doubt is inseparable from war, but we must trust to the good sense of the Government and the majority of the people to see that the manufacturing trades in this country are given a fair field to make good the national losses; there is no other way.

#### PROSPECTS OF THE NEAR FUTURE.

As regards prospects for the current year, all I can say is that the firm orders on our books already amount to more than we have ever had before. Our policy has been, and will be, to do everything we possibly can for the Government. When peace



comes eventually we shall be left with very large manufacturing facilities, certainly second to none in this part of the world, so we ought to have great opportunities then for helping to keep things going and doing our full share towards replenishing the world's carrying capacity.

We believe that, on the whole, our men and women workers are as happy and contented as possible, taking into account the difficulties of the times. Their number now exceeds 4,000, apart altogether from Crossley Brothers (Limited), the parent company, which has its own activities in other fields. They are earning high wages, but we doubt if any other company is turning out more value per head.

#### A WORD FOR THE STAFF.

I cannot close my remarks without expressing my very great appreciation—in which I am sure you will all join—of our managing director and his staff; I do not think there is a man in the country who gets more loyal service from all his heads of departments, both in the offices and works, and from the draughtsmen, clerks, and other assistants, who have shown wonderful energy and enthusiasm throughout and have never failed to respond to the special efforts called for. We can, indeed, be proud of our staff, both women and men.

#### THE F. B. I.

This company, by the way, was one of the earliest members of the Federation of British Industries, now an immense organisation fast growing in influence and importance every day. Its management is in the hands of some of the best and most prominent men in the country—representing almost every trade. Its policy is broad-minded and sympathetic towards labour as well as capital. We hope all our friends who are employers, if they have not already joined, will seriously consider doing so, as unity is strength in everything.

#### TEN PER CENT. DIVIDEND.

I now beg to move that the directors' report be and is hereby adopted, and that a dividend of 10 per cent. (less income-tax) be paid to the shareholders on the register of this date.

Mr. W. M. LETTS seconded the resolution, which was carried unanimously.

Sir Kenneth Crossley was re-elected a director, and the auditors, Messrs. W. B. Peat and Co., were re-appointed for the current year, and the meeting was adjourned to a later date for the presentation of the accounts.

#### TRIPLEX SAFETY GLASS CO., LTD.

The result of the year's trading, as shown by the accounts to November 30th last, first issued, may be considered to be highly satisfactory. The total capital authorised, £60,000, has now been issued, and this has enabled the company to discharge its mortgage liabilities and to provide the additional working capital required for the extended business. A net profit is shown on the year's trading of £20,133, and after writing off a further £2,000 from development account and £250 for depreciation it is proposed to pay a final dividend of 6 per cent., making 10 per cent. for the year, leaving the large balance of £12,502 to be carried forward to cover excess profits duty and other contingencies.

It is stated in the report that the company has disposed of its Canadian rights to an American syndicate for a cash consideration and an interest in a new company about to be formed in the United States.

#### MORTGAGES AND CHARGES REGISTERED BY LIMITED COMPANIES.

MARTYNSIDE, LIMITED, WOKING.—Registered Dec. 3rd, 1917. Debenture, £30,000, to London County and Westminster Bank, Ltd. (General Charge).

#### NEW COMPANY REGISTERED.

WHITEMAN MANUFACTURING COMPANY (LIMITED), 15, BATEMAN STREET, W.—Registered Dec. 17th to carry on the business of manufacturers, factors, and repairers of all kinds of aeroplanes, flying machines, etc. Nominal capital, £7,000 in 3,000 7½ per cent. £1 Cumulative Preference shares and 3,000 £1 Preferred Ordinary shares, and 10,000 2s. Deferred shares. G. A.

#### ANOTHER WORKS JOURNAL.

The Cowper-Coles Aircraft Co., Ltd., of Sunbury-on-Thames, has produced the first number of a monthly house organ called "Ariel."

The magazine, which is retailed at 6d. per copy, contains a portrait of Mr. Sherard Cowper-Coles, the founder of the firm, and a short history of the growth of the business.

Thereafter follows the first instalment of a serial article entitled "The Aeroplane Simply Explained."

Under "Club Notes," the secretary of the "Cowper-Coles Employees' Club" reports progress.

The magazine contains the usual assortment of humorous paragraphs inseparable from the complete house magazine, as it is known to the aircraft industry.

The editorial article refers to a scheme now under contemplation whereby employees of the Cowper-Coles Aircraft Co., Ltd., will be enabled to take up shares in the Company on terms

which will appeal to the pockets of all grades of workers. The experiment should be watched with interest, because it seems not only desirable, but equitable that thrifty employees should be admitted to share in the prosperity of the works in which they are employed.

#### GENERAL HENDERSON AND THE AMERICAN AIR FLEET.

According to the American "Air Service Journal," Nov. 29th, New York, Major-General Sir David Henderson, in the course of an interview in London, warned the United States against an excess of standardisation in aeroplane construction.

General Henderson said that there is great danger of over-standardisation. "If you want the best type you must be continually improving and changing. The question the air commander must ask is, 'How long can you afford to go on with a particular type of machine?' and 'Whether it is likely soon to be superseded by a better type, developed either by ourselves or the enemy?'"

"The Germans have been fairly successful with a policy that involves the standardisation of engines and frequent changes in planes. The Germans had a certain advantage over the British at the start because they already had two good types of water-cooled engines. We started with French engines, but now have our own, and they are admitted far superior to anything the Germans ever produced. In aeroplane design we always have been better than the enemy, but in the early days of the war we were at a disadvantage because our planes were under-engined."

[One is much interested to hear of General Henderson preaching a doctrine so closely in agreement with the doctrine which this paper has preached ever since the beginning of the war, and so diametrically opposed to the system of standardisation which he himself so strenuously supported until a year or so ago.—Ed.]

He also stated that the American public should be prepared for fairly severe losses in the course of training, and said:—

"Your casualties in the United States are likely to be fairly severe, because you have not skilled instructors in sufficient numbers. We sent back to you a number of good men, especially some very valuable Americans who had been in the British Flying Corps, but it was impossible to spare the large numbers which are desirable for the big plans which you have under way."

"The best aviators in the British Army, speaking generally, are those who have been at it the longest. For instance, one of our squadrons contains 18 men who have downed 200 enemy machines in six months and won a victory over that superb German aviator, the late Lt. Voss. The leaders of that squadron are men who have had long experience at the game."

#### A CHANGE OF NAME.

It should be noted that as from Jan. 1st, 1918, the title of the Acetylene Illuminating Co., Ltd., has been changed to the Acetylene Equipment Co., Ltd.

The scope of this company's business has during recent years been greatly extended, and now embraces all branches of the acetylene industry as applied both to acetylene welding and acetylene lighting in all fields.

This change involves no alteration in the existing directorate or management, and one trusts that under the new name the good relations hitherto existing between the firm and its customers may continue.

#### A WAR NECESSITY.

Owing to the increased price of raw material and other circumstances resulting from the war, the management of Acclis and Pollock, Ltd., of Oldbury, Birmingham, find it necessary to advance the price of all their well-known makes of spanners to 50 per cent. above the published lists, instead of the 16½ per cent. advance made of late. This step has been taken reluctantly, but everyone will understand that the increase of price is inevitable. Details of the new prices will be sent to all traders on application to the offices of the firm.

#### THE AIR NAVIGATION CO., LTD.

It should be noted that the business of L. Blériot-Aeronautics has been acquired by the Air Navigation Co., Ltd., and that the business is being conducted under that style as from January 1st, 1918.

All debts and liabilities of L. Blériot-Aeronautics will be discharged by the Air Navigation Co., Ltd., who will also receive all sums and monies due and payable to the late firm. There will be no change in the management and staff and the same premises will be occupied.

#### WORK FOR WOMEN.

The Marchioness of Londonderry appeals for more women motor transport drivers for the Royal Flying Corps. Applicants must have driving experience and be willing to serve where required in the United Kingdom. Inquiries should be addressed to Londonderry House, Park Lane, W.1.



# LANG PROPELLER LIMITED

Specialize in the design and construction of  
airscrews for whatever purpose they are required

Recent extensions enable the Company to cope  
with large orders for urgent delivery

CONTRACTORS TO  
H.M. ADMIRALTY AND WAR OFFICE

**WEYBRIDGE**  
**SURREY**



Telephones: Weybridge 520 and 521.  
Telegrams: "AEROSTICKS," WEYBRIDGE.

# THOS. ROBINSON & SON, Ltd.

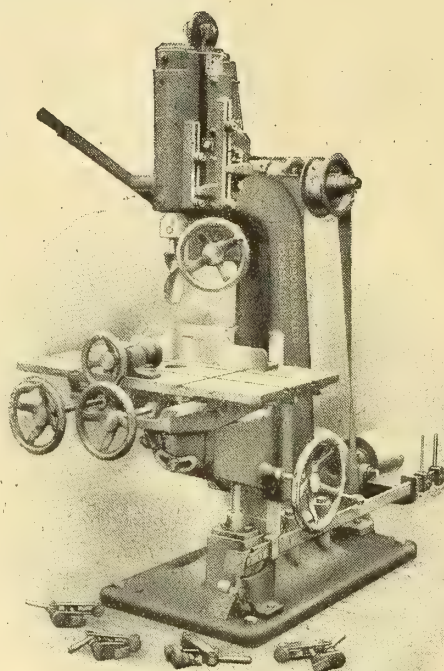
## ROCHDALE, ENG.

### Vertical Boring and Recessing Machine

Specially designed for accurate work

For boring, drilling, and recessing  
the bosses of propellers, etc.; half  
lapping and mitreing the laminations;  
recessing and drilling the spars, etc.

**TYPE PF.**



*Write for further particulars.*

# GWYNNES

LIMITED

CONTRACTORS TO H.M. ADMIRALTY AND WAR OFFICE.

SOLE LICENSEES AND MANUFACTURERS IN THE BRITISH EMPIRE  
OF THE

**"CLERGET" PATENT AERO ENGINES.**



WORKS & OFFICES: { CRISP ROAD, HAMMERSMITH, W.6. } LONDON.  
                                  { CHURCH WHARF, CHISWICK, W.4. }

TELEPHONES: 1910 HAMMERSMITH (3 lines).  
                  1780 CHISWICK 3 lines).

TELEGRAMS: "GWYNNE, LONDON."

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



(Continued from page 1721).

CHARLES RUSSELL PLEDGER, Esq.

Aeronautics Finance, Finance Dept., Min. of Munitions.

Capt. DAVID MACKINLAY POTTER RIACH.

Production Officer, Engines Branch, Air Board.

Maj. WILLIAM JOHN RYAN, R.F.C.

GEORGE GREIG SINCLAIR, Esq.

Actg. Civil Engineer, in charge of Works, R.N.A.S., Central Depot, Cranwell.

HENRY CHARLES WATTS, Esq.

Head of Sub-Section of Air Board, Technical Dept.

Miss CONSTANCE EVELYN WINWOOD SMITH.

Personal Asst. to Director of Supply and Production, Air Board.

The King has been pleased to award a second bar to the Military Cross to

Sec. Lt. (Temp. Capt.) GILBERT WARE MURLIS GREEN, D.S.O., M.C., Gen. List and R.F.C.

While flying at night on patrol duty he encountered an enemy aeroplane, which he attacked with great determination and skill, and although there was very little light he succeeded in hitting one of the engines of the machine, which, by reason of the damage, was forced to come down in the sea off a south coast port, where two of the occupants of the machine were made prisoners.

## FROM THE COURT CIRCULAR.

YORK COTTAGE, SANDRINGHAM, Jan. 2nd.

The following Officer had the honour of being received by His Majesty at Buckingham Palace, when the King invested him with the Insignia of Companion of the Order into which he had been admitted:—

THE DISTINGUISHED SERVICE ORDER.

Lt.-Col. ROBERT LORRAINE, R.F.C.

His Majesty then conferred decorations as follows:—

THE DISTINGUISHED SERVICE CROSS.

Flt. Comdr. RICHARD GARDNER, R.N.A.S.

Obsr. Sub-Lt. THOMAS TERRELL, R.N.A.S.

THE MILITARY CROSS AND BAR.

Capt. REGINALD HOIDGE, R.F.C.

THE MILITARY CROSS.

Maj. CYRIL CROWE, R.F.C.

Capt. JAMES BUTLER, Royal Irish Fusiliers and R.F.C.

Capt. ARTHUR GLENNY, A.S.C. and R.F.C.

Lt. EDWARD BARRINGTON, Devon. Regt., attd. R.F.C.

Lt. WILLIAM CAMBRAY, Lon. Regt., attd. R.F.C.

Lt. ALBERT GODFREY, R.F.C.

Lt. SYDNEY JEROME, Royal Fusiliers, attd. R.F.C.

Lt. VICTOR SCOTT, East Sur. Regt., attd. R.F.C.

Sec. Lt. LLEWELLYN DAVIES, R.F.C.

Sec. Lt. PAUL WILKINS, R.E., attd. R.F.C.

The King held a Council at 1 o'clock.

Lord Rothermere (President of the Air Board) among others was present.

At the Council His Majesty handed the Seals of Secretary of State to the Lord Rothermere, who took the Oath of Office and kissed hands upon appointment.

## NAVAL.

The following appointments have been made in the Royal Naval Air Service:—

JAN. 1st.—Warrt. Officer (1st Gr.).—F. J. Hooper, promoted to Obsr. Lt. (permanent), seny. Jan. 1st.

JAN. 2nd.—Mr. R. G. G. Harley, granted temp. commission as Lt. (R.N.V.R.), seny. Dec. 31st.

JAN. 3rd.—Mr. H. A. Adams granted temp. commission as Lt. (R.N.V.R.), seny. Jan. 2nd.

JAN. 4th.—Lt. (R.N.V.R.), Temp.).—H. W. Eades, entered as Proby. Obsr. Officer (Temp.), seny., Jan. 3rd.

JAN. 5th.—Temp. Comms. (R.N.V.R.) have been granted to the under-mentioned, seny. as stated.—Lts.—H. M. Winstanley, Dec. 28th; L. P. D. Cooper, Jan. 1st; and H. W. K. Jennings, Jan. 7th.

JAN. 7th.—Wing Comdr.—G. Gordon, D.S.O., to Ark Royal (undated).

Lt., R.N.V.R. (temp.).—J. E. Arrol-Hunter, to "President H," addl., for R.N.A.S., Constructional Corps, Jan. 5th.

Mr. S. P. Dobbs granted temp. commission as Lt. (R.N.V.R.), seny. Jan. 4th.

## ADMIRALTY COMMUNIQUEES.

JAN. 5th.—On the 4th instant a bombing raid was carried out by naval aircraft on Ghisteltes aerodrome, and numerous bombs were dropped among the sheds and buildings.

All our machines returned safely.

## THE CASUALTY LIST.

Reported Jan. 2nd.

KILLED.—Harrison, Flt. Sub-Lt. D. W., R.N.

SLIGHTLY WOUNDED.—Beaston, Flt. Sub-Lt. C. R., R.N.

ACCIDENTALLY INJURED.—Graham, Actg. Sqdn. Comdr. R., D.S.O., D.S.C., R.N.

Reported Jan. 3rd.

DROWNED.—Shearer, G. D. R., Air Mech., 2nd Gr., F17782.

Reported Jan. 5th.

DIED OF INJURIES.—Anderson, Proby. Flt. Officer F. M., R.N.

PREVIOUSLY REPORTED MISSING, NOW REPORTED DIED OF WOUNDS AS A PRISONER.—Black, Flt. Sub-Lt. N., R.N.

## PERSONAL NOTICES.

## ENGAGEMENT.

GOW—HODGSON.—A marriage has been arranged between Flt. Obsr. Russell W. Gow, D.S.O., D.S.C., R.N.A.S., son of Mr. and Mrs. Gow, of Druids Lodge, Hoylake, Cheshire, and Gladys, younger daughter of Mr. and Mrs. Hodgson, of Westwood Hall, Beverley, Yorkshire.

## BIRTH.

KENT.—On Dec. 31st, at Ulverston, The Drive, Hendon, N.W., to the wife of Flt.-Lt. D. Kent, a son.

Flt. Sub-Lt. W. Houston Stewart, R.N., was reported missing on May 26th. If any officer or man can give any information, or if relatives of prisoners of war in Germany would ask for news, the information would be gratefully received by Mrs. A. Houston Stewart, of 123, Abbey Road, Barrow-in-Furness.

## MILITARY.

## G.H.Q. COMMUNIQUEES.

JAN. 1st, 10.10 p.m.—On Dec. 31st very little flying was possible owing to the mist.

During the night, although the improvement in the weather was slight, our aeroplanes dropped over 100 bombs on hostile billets in the neighbourhood of Roulers and Menin. Several direct hits were obtained, and a train in movement was also bombed and hit.

All our machines returned.

JAN. 2nd, 9.30 p.m.—On the 1st inst. our aeroplanes were very active. Much registration work was carried out with the artillery, and many photographs were taken of the enemy's front lines and back areas.

Over 200 bombs were dropped by us on various targets, including a large ammunition depot near Courtrai and Ingelmünster aerodrome.

In the air fighting two hostile machines were brought down and two others driven down out of control. Another hostile machine was shot down in our lines by our anti-aircraft guns.

One of our aeroplanes is missing.

JAN. 3rd, 9.48 p.m.—On the 2nd instant thick mist greatly hindered the work of our aeroplanes, but during the night a few bombs were dropped by us on Carnin (east of La Bassée) in spite of very bad weather. One hostile machine was brought down in air fighting.

JAN. 4th, 10.5 p.m.—The fine weather on the 3rd instant led to great aerial activity on both sides.

Our aeroplanes observed for the artillery throughout the day, and took a great many successful photographs both in the enemy's forward and back areas. A total of 200 bombs were dropped on two hostile aerodromes, on Ledeghem railway junction, on hutments in the neighbourhood of Houthulst Forest, and on billets south of Lille.

Six hostile aeroplanes were brought down in air fighting, and two others were driven down out of control.

Three of our aeroplanes are missing.

During the night of the 3rd-4th instant, further 300 bombs were dropped on six of the enemy's aerodromes, including Gontrode aerodrome.

Successful raids were also carried out, in spite of very bad weather, against the factories at Maizières-les-Metz, the railway communications at Woippy, and the railway junction at St. Privat, all of which are in the neighbourhood of Metz.

All our machines returned.

JAN. 5th, 9.15 p.m.—On the 4th instant there was again great activity in the air, and photographic and artillery work was continued all day.

The strong wind prevented our aeroplanes from carrying out long-distance bombing raids, but over 250 bombs were dropped on Denain (north of Cambrai), Ledeghem, Menin, and Roulers railway stations. Many thousands of rounds were fired from a low height at active hostile machine guns and at the enemy's trenches.

Most of the fighting was confined to the northern portion of the front, where eight hostile machines were brought down and two others driven down out of control.

Five of our machines are missing.

During the night of the 4th-5th instant our machines attempted to bomb once more the factories and railway communications at Maizières-les-Metz. Although visibility was bad and the sky covered with low clouds, several pilots succeeded in dropping their bombs on their objectives, while others released their bombs on other targets of military importance in the neighbourhood.

All our machines returned.

JAN. 6th, 9.50 p.m.—On the 5th inst. little flying was possible, owing to unfavourable weather, but half-a-ton of explosives was dropped by our aeroplanes, and nearly 6,000 rounds fired from machine guns from the air at the enemy's troops and at other targets.

On the night of the 5th-6th inst. over half-a-ton of bombs was dropped on Ramegnies Chin aerodrome, where direct hits were obtained, and also on stations and hostile billets.

A ton of bombs was also dropped on Conflans station and sidings, north-west of Metz. Many direct hits were observed, and a large explosion and fire were caused. Half-a-ton of bombs was dropped on Courcelles station, south-east of Metz.

JAN. 7th, 9.5 p.m.—On the 6th inst. much successful work was accomplished by our aeroplanes in co-operation with artillery.

A large number of photographs were taken and 12,000 rounds were fired from machine-guns at hostile troops, transport, and other targets. Nearly three tons of bombs were dropped by our aeroplanes on different objectives.

A number of fights took place in the air, as the result of which six hostile machines were brought down and two others driven down out of control.

One of our machines is missing.

#### WAR OFFICE COMMUNIQUÉS.

JAN. 1st.—The G.O.C. the British Forces in Italy reports:—British artillery and aircraft continue their efforts daily to destroy the enemy's batteries.

In retaliation for the loss they suffered on Dec. 26th, when they lost 11 machines, enemy aircraft have been very active lately in bombing raids. The damage inflicted by their bombing raids has been slight.

JAN. 1st.—The G.O.C. the British Forces in Macedonia reports:—

Our aeroplanes have bombed Mirsla and Bujukanah (west of Demirhissar) and Cernoste (west of Lake Doiran).

JAN. 3rd.—The G.O.C. the British Forces in Italy reports:—Splendid work is being done by our R.F.C., who have destroyed several enemy aircraft, and have successfully carried out long distance reconnaissances.

The enemy is continuing his bombing activity at night on undefended towns.

JAN. 4th.—The G.O.C. the British Forces in Palestine reports:—

A successful bombing raid has been carried out at Afuleh, direct hits being obtained on rolling stock, hangars, and camp. One machine was shot down.

JAN. 4th.—The G.O.C. the British Forces in Mesopotamia reports:—

The situation in Mesopotamia remains unchanged. During the last week of December our aeroplanes dropped bombs on a Turkish camp at Kifri, about 100 miles north-east of Bagdad, on the main road to Mosul, and fired into another camp at Chaman Kupri, 13 miles south of Kifri; we bombarded also the Turkish aerodrome near the junction of the Lesser Zab with the Tigris, 135 miles above Bagdad.

During the night of December 30th-31st Turkish aeroplanes dropped bombs near Samarra, on the Tigris above Bagdad, and Kizil Rohat, towards the Persian frontier, but with insignificant results.

JAN. 7th.—The G.O.C. the British Forces at Aden reports:—On Jan. 5th a strong reconnaissance was made towards Hatum and Jabir.

Aeroplanes co-operated with our artillery, who did great execution on the enemy's infantry in the open with direct observation at effective range.

#### THE CASUALTY LIST.

Reported Jan. 2nd.

KILLED.—Cameron, Sec. Lt. C. W., R.F.C.

Flower, Sec. Lt. F. G., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Cornish, Sec. Lt. W. O., R.F.C.

MacGregor, Lt. D. A. D. S., R.F.C.

Nichols, Sec. Lt. S. L., R.F.C.

WOUNDED.—Griffiths, Sec. Lt. H. J., S. Wales Bord., attd. R.F.C.

Hockey, Sec. Lt. G. W., R.F.C.

Phillips, Sec. Lt. R. O., R.F.C.

MISSING.—Robertson, Sec. Lt. J. A. M., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER IN GERMAN HANDS.—Thompson, Sec. Lt. A., R.F.C.

CANADIAN FORCE.—PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER IN GERMAN HANDS.—Kert, Lt. L., Rly. Troops, attd. R.F.C.

Reported Jan. 3rd.

KILLED.—Cox, Sec. Lt. A. G., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Golding, Lt. E., A.S.C., attd. R.F.C.

Hood, Lt. J., Arg. and Suth'd Highrs., attd. R.F.C.

Jarvis, Capt. A. B., Midd'x R., attd. R.F.C.

Richardson, Sec. Lt. J. L., Glouc. R., attd. R.F.C.

WOUNDED.—Bulteel, Lt. J. C., R. Fus., attd. R.F.C.

Whittaker, Sec. Lt. J., R.F.C.

PREVIOUSLY REPORTED PRISONER NOW REPORTED WOUNDED AND PRISONER IN GERMAN HANDS.—Golding, Sec. Lt. K. L., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN GERMAN HANDS.—Baker, Sec. Lt. F. G., R.F.C.

Goodchap, Lt. A. F., Glouc. R., attd. R.F.C.

Goode, Lt. R. J. E. P., R. Dub. Fus., attd. R.F.C.

Middleton, Lt. A. H., R. Muns. Fus., attd. R.F.C.

Petersen, Sec. Lt. G. G. W., R.F.C.

Spiro, Sec. Lt. S. G., R.F.C.

Reported Jan. 4th.

WOUNDED.—Dunn, Capt. F. G., R.F.C.

Hungerford, Sec. Lt. A. R., R.F.C.

Lynn, Lt. G. W., R.F.C.

MISSING.—Cameron, Sec. Lt. I. D., R.F.C.

Cowan, Sec. Lt. R. H., R.F.C.

Maybery, Capt. R. A., M.C., Lrs., attd. R.F.C.

Sage, Sec. Lt. D. M., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED WOUNDED AND PRISONER IN GERMAN HANDS.—Johnston, Capt. J. E., Ches. R. and R.F.C.

AUSTRALIAN FORCE.—KILLED.—Sandy, Lt. J. L., Fl. Corps.

DIED.—Mott, Lt. A. E. P., Fl. Corps.

Reported, Jan. 5th.

KILLED.—Egerton, Maj. R., M.C., R. Ir. Fus., attd. R.F.C.

Medlen, Sec. Lt. L. L., R.F.C.

Mott, Sec. Lt. J. E., R. Ir. Fus. attd. R.F.C.

Neily, Sec. Lt. F. E., R.F.C.

Ottley, Sec. Lt. R. B. G., N. Staff. R., attd. R.F.C.

Youldale, Capt. A. C., M.C. R.F.C.

DIED OF WOUNDS.—MacLennan, Sec. Lt. R. W., R.F.C.

AUSTRALIAN FORCE.—KILLED.—Cornell, Sec. Lt. H. G., Fl. Corps.

Reported Jan. 7th.

MISSING.—Castle, Sec. Lt. A. F., R.F.C.

Turner, Sec. Lt. G. F., R.F.C.

CANADIAN FORCES.—KILLED.—Read, Lt. E. H., Can. For. Corps, attd. R.F.C.

WOUNDED.—Sanders, Lt. N. MacL., Can. A.S.C., attd. R.F.C.

Reported Jan. 8th.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—

Falkiner, Sec. Lt. F. B., M.C., R. Ir. Rif., attd. R.F.C.

MacDaniel, Sec. Lt. J., R. Dub. Fus., attd. R.F.C.

WOUNDED.—Walmsley, Lt. N. W., Lan. Fus., attd. R.F.C.

MISSING.—May, Lt. L. B., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN GERMAN HANDS.—Garratt, Sec. Lt. J. C., R.F.C.

Henry, Sec. Lt. S. S., R.F.C.

\* \* \*

#### CASUALTIES AMONG N.C.Os. AND MEN.

THE DATES ARE THOSE OF THE OFFICIAL LIST.

##### KILLED.

DEC. 22nd.—R.F.C.—Pinhay 25176 2nd Cl. Air Mech. S. C. (Plymouth).

##### DIED OF WOUNDS.

DEC. 28th.—R.F.C.—Sampson 8303 Serjt. A. J. (Norwich).

PREVIOUSLY REPORTED WOUNDED, NOW REPORTED DIED OF WOUNDS.

DEC. 27th.—R.F.C.—Burn 25160 2nd Cl. Air Mech. D. (Leeds).

##### DIED.

DEC. 22nd.—R.F.C.—Griffiths 83343 Mech. Actg. Cpl. R. W. (Liverpool); Wiseman 107145 3rd Cl. Air Mech. E. G. (Fulham, S.W.)

##### WOUNDED.

DEC. 22nd.—R.F.C.—Andrews 76330 2nd Cl. Air Mech. G. (Dunkirk); Brett 16874 1st Cl. Air Mech. L. A. (East Ham, E.); Black 18732 2nd Cl. Air Mech. T. (Port Patrick); Goodman 11259 2nd Cl. Air Mech. W. (Kennington, S.E.); Haigh 21708 2nd Cl. Air Mech. T. (Gainsborough); Leigh 4843 Serjt. J. (Haigh); McMechan 106099 2nd Cl. Air Mech. J. (Horwich); Rotsey 16849 1st Cl. Air Mech. F. T. (Kilburn, N.W.); Thorne 19208 2nd Cl. Air Mech. J. H. (London, S.W.)

DEC. 28th.—Turner 51715 3rd Cl. Air Mech. C. E. (Harlesden, N.W.)

DEC. 29th.—Helson 9681 Cpl. R. H. (Exeter); Sayers 107462 3rd Cl. Air Mech. T. (Sunderland).

##### AUSTRALIAN IMPERIAL FORCE.

PREVIOUSLY REPORTED KILLED, NOW REPORTED DIED OF WOUNDS

DEC. 22nd.—A.F.C.—Lauchland 1320 R.



## DIED.

DEC. 27th.—A.F.C.—Bucknall 527 G.

## WOUNDED.

DEC. 22nd.—A.F.C.—Barkell 706 T. H.

DEC. 28th.—A.F.C.—Keritz 180 C.

## PERSONAL NOTICES.

## DEATHS.

**BELL.**—Capt. John Bell, R.F.C., who died of wounds on Dec. 27th at a casualty clearing station, was son of the late John Bell and of Mrs. Bell, of Geelong, Victoria, Australia.

**BOOTH.**—Lt. William Booth, Rifle Brigade, att'd. R.F.C., was killed whilst flying in France on Dec. 28th. He was 21 years of age, and was the younger son of Mr. and Mrs. W. H. Booth, of 81, Dartmouth Park Road, N.W.5.

**CUMBERLAND.**—Sec. Lt. Cumberland, R.F.C., was killed by the fall of his aeroplane at Tarporley, Cheshire, on Jan. 3rd. The machine caught fire in the air.

**DENHAM.**—Sec. Lt. William Malcolm Denham, R.F.C., who died on Jan. 3rd, through an accident whilst flying in England, was the only son of Mr. and Mrs. Frederic Denham, of Bedford. He was eighteen years of age.

**FEDDON.**—Lt. Cecil Olcher Feddon, Indian Infantry, att'd. R.F.C., was killed on Jan. 7th while making a flight during a snowstorm. He was obliged to descend into the North Sea, and died of exposure before he could be rescued. Mr. Feddon was an accomplished aviator, and had seen service in Mesopotamia and on the Western front, and had been wounded. He was married a few weeks ago to Shena, daughter of Lt.-Col. Fraser-Berwick.

**GRAHAM.**—Lt. Robert Lynedoch Graham, R.F.A. and R.F.C., was the second son of the Hon. T. Lynedoch Graham, Judge President of the Eastern Districts Courts, Grahamstown, South Africa. He was educated at St. Andrew's College, Grahamstown, and at Clare College, Cambridge, where he was an undergraduate when war was declared. Volunteering in Jan., 1915, he received a commission in the R.F.A. and went to France in the following May. In 1916 he transferred to the R.F.C., and was severely wounded in April. He was reported missing on Sept. 16th, and a message dropped by German aviators on Christmas Day stated that he had been killed on that date. He was 22 years of age, and a good sportsman who did things well.

**JENKINS.**—Lt. Arthur Lewis Jenkins, D.C.L.I., att'd. R.F.C., who was killed on the night of Dec. 31st while flying on patrol duty, aged 25, was the eldest of the five sons of the late Sir John Lewis Jenkins. He passed from his preparatory school, Packwood Haugh, into Marlborough in 1911 after a year as senior prefect to take up the second Balliol scholarship won in 1910.

He was a member of the Marlborough O.T.C. for five years, and for two years a cadet officer. He joined the D.C.L.I. in September, 1914, and, after serving in India and on the Aden front as machine-gun officer, went with his regiment to Palestine, subsequently transferring to the R.F.C. He took his wings last July.

**KNOX.**—Lt. John Vesey Knox, R.F.C. and London Regt., was the eldest son of Mr. Vesey Knox, K.C. He was educated at Wixenford, Wokingham, and Rugby (Steel's). After a short period of service in the Northamptonshire Regt., which he entered from the Royal Military College, he became a clerk in the Principal Probate Registry. He joined a battalion of the London Regt. on August 4th, 1914, and served in France from Feb., 1915, to July, 1916, when he was attached to the R.F.C. He broke his jaw in an accident while training in the autumn of 1916, but had recovered and recently qualified as a pilot. He was accidentally killed in this country on Jan. 4th.

**MORGAN.**—Sec. Lt. Wilfrid Gilbert Morgan, R.F.C., who died on Oct. 23rd, 1917, in a German field hospital from wounds received in action on Oct. 12th, was the youngest son of George Morgan, I.S.O., and Annie E. Morgan, of Downings, Wallington, Surrey. He was twenty-seven years of age.

**NICKSON and ELY.**—Lt. J. R. Nickson, R.F.C., a Canadian, and Lt. W. S. Ely, R.F.C., were killed, whilst flying on Jan. 2nd, at Wytham, near Oxford, when their machine nose-dived, apparently owing to engine trouble.

**READ.**—Lt. Edric Hurdman Read, Canadian Forestry Corps, att'd. R.F.C., who was killed on Dec. 26th, aged 19, was the younger son of Mr. and Mrs. Charles E. Read, of Ottawa. He was educated at Ashbury College in that city and was granted a commission in the Canadian Forestry Corps in April, 1916. He arrived in England in May of that year, and served with his unit in England until seconded for duty with the R.F.C. last April.

**WILCOX.**—Sec. Lt. William Wilcox, R.F.C., was killed in an eastern county on Dec. 31st, when his machine fell from a height of 200 feet. Mr. Wilcox, who died almost immediately, had returned from France only the week before.

**WOOD.**—Lt. F. Abbott Wood, Central Ontario Regt., att'd. R.F.C., was accidentally killed whilst flying in England on Jan. 4th.

## ENGAGEMENTS.

**HALLWARD—HAMPTON.**—An engagement is announced between Sec. Lt. Christopher John Hallward, R.F.C., youngest son of Mr. Reginald Hallward and Mrs. Hallward, of Woodlands, Shorne, Gravesend, and Isabel Cunliffe, only daughter of Mr. and Mrs. Herbert Hampton, of Maida Vale, W.

**JENSON—PALMER.**—The marriage arranged between Lt. J. Jenson, R.C., and Miss Gwynnifrid B. Palmer will take place at the parish church, Bushey, Herts, on Thursday, January 17th, at 2.30. There will be no reception, but all friends will be welcome at the church.

**LLOYD—LOUDON.**—The marriage arranged between Capt. Humphrey Clifford Lloyd, M.C., 60th Rifles, att'd. R.F.C., only son of Col. Wilford Lloyd, M.V.O., Royal Body Guard, and Mrs. Lloyd, and Constance, only daughter of Mr. and Mrs. James Hope Loudon; Olantigh, Wye, will take place at the Wye Church on Wednesday, Jan. 16th, at two o'clock.

**WILLS—CARR.**—A marriage has been arranged and will shortly take place, between Lt. Oliver Byerley Walters Wills, M.C., R.F.C., eldest son of Mr. and Mrs. G. T. Wills, of Moorings, Sunningdale, Berks, and Ursula, second daughter of Mr. and Mrs. H. Wildon Carr, of 107, Church Street, Chelsea.

**WRIGHT—FLETCHER.**—The marriage between Mr. F. Whitworth Wright, R.F.C., and Miss Joyce M. Morley Fletcher will take place at Holy Trinity Church, Marylebone, at 2 o'clock on Tuesday, Feb. 5th. All friends will be welcome at the church.

## MARRIAGES.

**COTTERILL—PEARSON.**—On Dec. 20th, at the Consulate and the Embassy Church, Paris, Capt. E. W. Seton Cotterill, Royal Fusiliers, att'd. R.F.C., only son of Mr. and Mrs. Cotterill, Moorside, Dore, near Sheffield, was married to Lallie, second daughter of Sir C. Arthur Pearson, Bart.

**MACLEAN—MORRIS.**—On Dec. 15th, at St. Peter's, Cranley Gardens, Capt. L. L. MacLean, I.A. and R.F.C., elder son of the late Loudoun F. MacLean, C.I.E., and Mrs. MacLean, 9, Longfield Road, Ealing, was married to Phyllis Aileen, eldest daughter of the late Lt.-Col. G. M. Morris and Mrs. Morris, 98, Philbeach Gardens, Earl's Court.

**MARTIN—BARRY.**—On Jan. 2nd, at All Saints' Church, Child's Hill, Capt. G. Neville Martin, Durham Light Infantry and R.F.C., only son of the late Mr. G. H. Martin and of Mrs. Martin, of Bedford, was married to Aldis, the eldest daughter of Mr. and Mrs. C. J. Barry, of "Ardlethen," Hampstead, N.W., by the Right Rev. the Lord Bishop of Willesden, assisted by the Vicar, the Rev. W. D. H. Petter.

**MOFFATT—PENDER—SMITH.**—The marriage of Capt. Ian McAlister Moffatt-Pender, Seaforth, Highlrs. and R.F.C., youngest son of Mr. and Mrs. Pender, Onich, Great Bookham, Surrey, and Lorna Ledlie, younger daughter of the late William Smith, of Ravenswood, East St. Kilda, Melbourne, and Mrs. Smith, took place at the Church of St. Mary Abbot's, Kensington, on Thursday, Dec. 27th. The ceremony was performed by Col. J. W. Griffiths, S.C.F., Woolwich, cousin of the bride, who was given away by her uncle, Gunner Herbert Wilson, Australian Artillery. The bridegroom's brother, Mr. Randolph Pender, was best man.

**POWER—COULDERY.**—On Dec. 31st, 1917, at the Church of Our Lady Star of the Sea, Hastings, Sec. Lt. Leonard Teevan Power, R.F.C., youngest son of Mr. and Mrs. Power, of 77, Brook Green, W., was married to Mary Barbara Dalzell, widow of the late W. Watkins Coultery, and daughter of Mr. and Mrs. Blomfield, of Hastings, by the Rev. E. Moultrie.

## BIRTHS.

**COWAN.**—On Dec. 31st, at 19, Carpenter Road, Edgbaston, Birmingham, to Dorothy (née Fairgrieve), the wife of W. G. B. Cowan (late R.F.C.), a son, who survived his birth only a few hours.

**SPENCER.**—On Jan. 2nd, the wife of Lt. J. G. Spencer, R.F.C.—a son.

**SWANSON.**—On Jan. 1st, at Connaught Lodge, Westenhanger, Hythe, Kent, Brenda, the wife of Capt. G. W. Swanson, Hants Regt. and R.F.C., of a son, prematurely (still-born).

Sec. Lt. Gerard A. H. Parkes, R.F.C., of Upper Staplehall, Northfield, Birmingham, wounded prisoner of war in Germany since July 15th last, having lost the use of one hand, has been transferred for further surgical treatment to Chateau d'Oex, Switzerland, where he arrived on Dec. 28th.

Sec. Lt. George Cowie, R.F.C., was reported missing on Oct. 22nd. If relatives of prisoners of war in Germany kindly ask for news of him, the same will be gratefully received by Mrs. Cowie, of 10, Abinger-gardens, Edinburgh.

The aviator brought down during the raid on Mannheim proves to be Sec. Lt. G. F. Turner. News to this effect has



been received by his wife, who is a daughter of the late Mr. John Borthwick, a Carlisle journalist. Mr. Turner is the eldest son of the Rev. F. H. Turner, of Bolton, Lancashire.

Capt. L. F. Jenkin, M.C., R.F.C., was reported missing Sept. 11th. If any officer or man can give any information, or if relatives of prisoners of war in Germany would ask for news, the same would be gratefully received by Mrs. A. F. Jenkin, of 92, Iverna Court, London, W.8.

Lord Ashbourne flew over Dublin in an R.F.C. aeroplane on Jan. 3rd for 35 minutes, and dropped leaflets concerning Lady Drogheda's aerial exhibition now being held in Dublin.

## FRANCE

### OFFICIAL COMMUNIQUÉS.

JAN. 1st.—During aerial fighting in the last few days Sub-Lt. Guerin and Lt. Hugues each brought down his 10th German aeroplane.

JAN. 2nd.—Our pilots, in the course of numerous aerial fights, brought down yesterday four German aeroplanes, and in addition two other enemy machines, which were seriously damaged, fell in their own lines.

ARMY OF THE ORIENT.—Enemy aeroplanes bombarded ambulances behind the Monastir front.

JAN. 4th.—During yesterday (Thursday) our pilots brought down two German aeroplanes and a captive balloon. Six other enemy machines fell in their own lines as the result of air fights.

The same day our squadrons bombarded the factories of Rombach and the railway stations of Metz-Sablons, Conflans, Arnville, etc. Seven thousand five hundred kilogrammes (about 7½ tons) of projectiles were dropped in the course of these expeditions.

JAN. 5th.—On Jan. 4th five German aeroplanes were brought down in fights with our pilots.

JAN. 6th.—ARMY OF THE ORIENT.—To the north of Lake Prespa French aviators dropped bombs on enemy cantonments and convoys.

JAN. 7th.—On Jan. 5th four German aeroplanes were brought down by our pilots and a fifth by the fire of our special guns.

Serjt.-Aviateur Mox, son of the Governor of the Invalides, who has been a prisoner of war in Germany for two years, has succeeded in escaping after five futile attempts.

## GERMANY.

### OFFICIAL COMMUNIQUÉS.

JAN. 4th.—Since Jan. 1st the enemy has lost in aerial fighting and by gunfire 23 aeroplanes and two captive balloons.

Ober Lt. Loerzer obtained his 20th victory in the air.

JAN. 6th.—On Jan. 4th and 5th, as a result of aerial encounters and by fire from the ground, 15 enemy aeroplanes and four captive balloons were shot down.

Mr. H. Patrick Devitte, writing from Geneva on Jan. 6th, states that fifty aged and wealthy Germans, men and women, have arrived at Basle from Mannheim, who state that they are homeless in consequence of the British reprisal raid, which caused immense havoc. It will be remembered that the Wolff Agency officially announced that the material damage was insignificant. The Germans at the frontier turned back about fifty other people from Rhine towns who were seeking safety in Switzerland. In readiness for further raids the Germans have brought Allied officer prisoners to Mannheim, and lodged them near the main station.

## ITALY.

### OFFICIAL COMMUNIQUÉS.

JAN. 1st.—During the night enemy aviators attacked the aviation camp of Istrana and repeated the aggression against inhabited and open cities. Vicenza, Bassano, Castelfranco, and Treviso were bombed.

Altogether we have registered 13 dead and 44 wounded, for the most part belonging to the civil population. The damage is slight.

Our air squadrons bombarded enemy aviation camps. Two hostile machines were brought down during the day by French and British aviators.

JAN. 2nd.—Aviators and English batteries brought down three enemy aeroplanes, and two others fell down as the result of aerial battles with the Italian and French aviators.

During the course of the night enemy aviators dropped a few bombs on Mestre (five miles from Venice) and Treviso (18 miles from Venice), without causing any damage or victims. They also bombed Bassano (on the Brenta where it emerges into the plain), where the death of one person and the wounding of five others and slight damage must be deplored.

Our squadrons bombed the aviation camps at La Comina and Aviano (at the foot of the mountains, 20 miles north-east of Conegliano), causing extensive fires. Enemy movements at the railway station of S. Stino de Livenza (10 miles east of the

Piave) and the barracks have been bombed effectively by one of our airships.

JAN. 3rd.—During the night of Jan. 1st-2nd, enemy aviators dropped bombs on Castelfranco, Veneto (about 25 miles from Venice), obtaining direct hits on two hospitals. Eighteen of the patients were killed.

JAN. 4th.—One hostile aeroplane was brought down by a British aviator near Conegliano, and another machine was brought down by our fire on the left bank of the Piave, east of Maserada (about seven miles north-east of Treviso).

Yesterday, between 2 and 6 in the morning, enemy aircraft carried out raids between the Piave and the Bacchiglione (flowing south of Padua).

Numerous bombs were dropped in the inhabited parts of Treviso and Padua. In the former city slight damage was done. There were no casualties. In the latter city, the centre of which was chosen, as usual, as a target with particular fury, some fires broke out. Several private buildings were damaged, and six people, including two women and one old man, were wounded.

JAN. 5th.—British aviators destroyed a hostile captive balloon at Susegana (on the Piave at north edge of the Plain), and brought down an aeroplane near Corbolone (Livenza), 12 miles from the sea.

During the day and the night there was considerable aerial activity in both front lines and in the back areas. Our aviators bombarded with good results hutments and aviation camps. The station of Levico, Trentino, and the adjacent magazines were bombarded with 1,200 kilos (about one ton) of bombs.

Enemy aircraft dropped bombs on Mestre (five miles north of Venice), Bassano (at entrance of the Brenta to the Plain), and Castelfranco (25 miles from Venice), causing slight damage and some casualties in the last-named place.

JAN. 6th.—Along the whole front the usual harassing fire by the artillery of both sides, and intense activity of our own and enemy aircraft in reconnaissance.

A message from Rome, dated Jan. 6th, states that the Pope, in thanking the Roman aristocracy for their Christmas and New Year's greetings, expressed his satisfaction that the nobility had joined the Holy See in condemning the recent air raids, which were against the rights of man. The Pope said that, faithful to his programme, which condemned injustice wherever it appeared, he had raised his voice against a form of war which was used against undefended cities while obtaining no military results, and caused victims among non-combatants, besides damaging churches and art treasures, and still further embittering national hatreds and rancours.

Mr. G. Ward Price, writing from Italy on Jan. 1st, says, in the "Daily Telegraph":—

"Italian aviators have shown that they know the counter of the Austro-German attacks of the last four nights upon the cities of the Venetian plain. The night before last, as the official communiqué related, they made their way, while the enemy machines were out on their evil work, to the nests from which the night birds came, and they found the Austrian aerodromes all lighted up in expectation of the return of the raiders. The Italian aviators dropped a few bombs; but that was only a reconnaissance.

"Last night, when the Austrians were out again, the Italians set off once more, heavily laden with incendiary and explosive bombs. They made for Aviano, which is an Austrian aerodrome, and for Comina. Coming down low in the darkness the Italians deliberately chose their marks, and then let go their bombs. The result was that the Comina aerodrome was very severely damaged. The sheds were smashed and burned, and there were several explosions, probably in a bomb dump. So complete was the devastation that an Italian machine was able to go back to-day and photograph the ruins at 1,500 ft.

"Aviano, too, was very badly wrecked, and the Italian fliers, when they reached their own aerodrome again, got out of their machines with a shout of satisfaction.

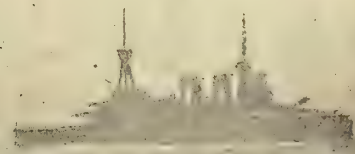
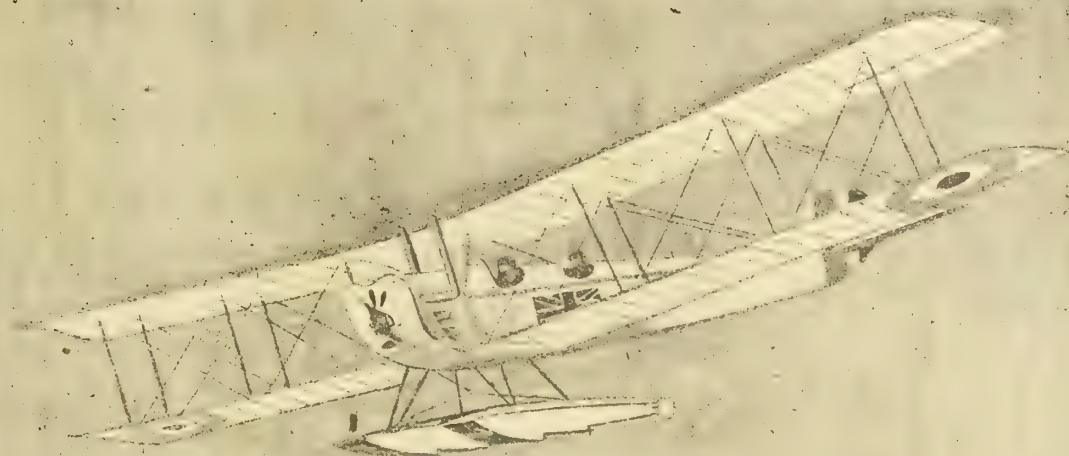
"A remarkable thing they saw during this flight was a huge fire burning near the mouth of the Tagliamento, as if a great ammunition dump had exploded there. The dense smoke pouring up hundreds of feet into the air entirely hid the river mouth from sight."

The following somewhat tall story of an Italian aviator's adventure comes from the Milan correspondent of the Central News:—Among the many extraordinary achievements of Italian aviators, none is more remarkable than that of Giovanni Ancillotto, who drove his machine through a flaming observation balloon. From the story, as related by the "Secolo," in a message from the front, it appears that Ancillotto had been advised that the Austrian "drachen" at Rustigne was again in the air, protected by three chaser machines. He immediately decided to attack it, and took with him three Italian chasers as escort.

The two squadrons were soon in contact, and the chasers en-



# THE WIGHT SEAPLANE



J. SAMUEL WHITE & CO., LTD.  
EAST COWES, I.W.

BUILDERS OF  
"WIGHT" Type Aircraft, Fast  
Torpedo Vessels, etc., etc., etc.

Telephone—No. 3 Cowes.

Telegrams—White. East Cowes.

W.W. BAILEY 17

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

gaged each other while Ancillotto attacked the "sausage." Clearing the fighting machines, he put on full speed, and then descended to about the level of the balloon, at which he opened fire with incendiary bullets at a range of about twenty yards. At the same moment he suddenly realised the danger he was in, for it was clearly impossible for him to avoid a collision with the now flaming monster. He described the thrilling episode in the following words:—

"I thought to myself 'It means death.' I shut off the engine, closed my eyes, and waited. Barely a second passed before I felt a shock; there was a sound of tearing; flames rushed across my face, and almost simultaneously I had the dreadful sensation of the void. I opened my eyes, and found myself a few dozen yards from the ground. I started the engine, and it responded; I tried the controls, and found they still acted.

"Then I steadied the machine, for by this time gusts of rifle fire were coming from below. I glanced at the wings, fearing their support would fail me. They were trembling as though broken, and were carrying some tattered pieces of stuff, though where this had come from I could not at the moment imagine. Nevertheless, the wings held, the propeller turned, and the aeroplane, slowly gaining speed, glided towards the Italian lines. A few minutes later I alighted at my camp, still without having realised what had happened."

Ancillotto's aeroplane had passed clean through the burning balloon; the propeller had torn one side of it, and the wings had carried away pieces of the envelope. In the shock of the collision the wings had been broken in the middle, but were actually held together by the support of the machine gun. The great speed at which he was travelling had carried him through the farther side of the balloon, and enabled his machine to free itself from the burning mass. [Perhaps.—Ed.]

#### TURKEY.

##### OFFICIAL COMMUNIQUÉ.

JAN. 4th.—The enemy undertook air attacks against Afuleh.

#### BELGIUM.

##### OFFICIAL COMMUNIQUÉ.

JAN. 4th.—Enemy aviators dropped torpedoes and bombs towards one of our hospitals in the region of Adinkerke.

#### HOLLAND.

A British biplane landed in Holland, at Biervliet, on Jan. 3rd, near the electric fence on the Belgian frontier.

Two men and one officer have been interned. The officer has been sent to hospital. He suffered intensely from cold, and with frozen hands and legs was unable to control the machine.

The Dutch Foreign Office, in an official communication on Jan. 3rd, state that inquiry has shown that the bombs dropped at Goes, in the Province of Zeeland, on Dec. 22nd, fatally injuring one resident, were entirely different in construction from those found in former cases, but that a label found on one of the "stabilisation wings" bore an English inscription. "The bombs were, therefore," the communiqué proceeds, "evidently of English make." The Dutch Minister in London has been charged to request the British Government to institute a thorough inquiry into the question whether this violation of Dutch territory was committed by a British aviator.

#### SOUTH AFRICA.

The South African newspapers report that Major Miller, D.S.O., R.F.C., is giving a series of exhibition flights in South Africa to impress upon the inhabitants the importance of flying in modern warfare. The aeroplane on which the demonstrations are being made is a two-seater tractor biplane of R.A.F. design, and quite a number of successful flights have recently been made. On one occasion Major Miller flew from Port Elizabeth to Cape Town, at the conclusion of which a very rough landing was made as a result of engine failure, but fortunately the pilot was not injured and the machine not damaged beyond repair.

#### U.S.A.

It is reported that the U.S.A. Government is advertising for amateur and professional marksmen who are willing to offer their services as instructors in trap shooting at the different aeronautical instruction centres. It is apparently the American idea that trap shooting will assist the attainment of marksmanship, but it is not clear whether the targets will be fired at from the ground or whether they will be fired from an aeroplane for the benefit of probationary gunners on other machines!

The annual report of Mr. Daniels, the Secretary of the United States Navy, for this year has an added importance, as it reveals the huge exertions made by the Department in preparing for the war's demands.

According to the "Times," Mr. Daniels describes in this report the evolution of the "Liberty" engine for aircraft, various types of flying-boats which have proved successful, and mentions with satisfaction a ship-launching catapult for seaplanes.

In connection with the administration of the Air Service, of

aircraft production, and the immense development of aircraft industry he says:—

"The Aircraft Board recently legalised and taking its membership, one-third from the Army, one-third from the Navy, and one-third from civil life, is continuing the excellent work done by the Aircraft Production Board which developed the 'Liberty' engine. The Army and Navy members consist of the officers who have charge of aeronautical matters in their respective departments, and the board operates under the direction and control of the Secretary of War and of the Secretary of the Navy.

"Thus in all matters affecting the at present gigantic problem of aircraft production and in dealing with the aircraft industry generally the two services act as a unit. In addition, there is a joint Army and Navy technical board, which passes upon all new designs for either service.

"Thanks to the present organisation and to the personality of the carefully chosen members of the boards concerned, there has been absolutely no conflict or difference between the two Services during the year as regards aeronautic matters, and no indications of the necessity or desirability for a separate aeronautic department as advocated by some.

"In time of war aeronautic operations and development must be controlled by those who are handling other Army and Navy activities, and there can be no argument otherwise unless the Army and Navy disagree. This has not happened so far, and there is no reason to anticipate its happening."

\* \* \*

The National Advisory Committee for Aeronautics has announced the formation of a Committee of Civil Aerial Transport, which appears to be somewhat on the lines of the British Civil Aerial Transport Committee.

The functions of the U.S. Civil Aerial Transport Committee will include, in addition to those formerly exercised by the Committee on Aerial Mail Service, the problems connected with the application of aircraft to civil purposes, the utilisation of military aeroplanes and aviators after the war for such purposes, and co-operation with similar organisations of other nations.

The organisation of this new committee is as follows:—

Dr. W. F. Durand, Chairman, Chairman of the National Advisory Committee for Aeronautics.

Dr. S. W. Stratton, Secretary of the National Advisory Committee for Aeronautics, and Director of the U.S. Bureau of Standards.

Professor Charles F. Marvin, Chief of the United States Weather Bureau.

Lieut.-Col. V. E. Clark, Signal Corps, U.S.A.

Lieut.-Commander J. H. Towers, U.S.N.

All of the above are members of the National Advisory Committee for Aeronautics.

\* \* \*

On Nov. 13th one of the Caproni biplanes which are being exhibited in America, flew from Norfolk, Va., to Mineola, N.Y., a distance of 326 miles in four hours. Ten persons were carried.

\* \* \*

The following amusing story from the "Daily Express" Correspondent in New York appeared in that paper on Jan. 4th:—

A "Herald" dispatch from Norfolk, Virginia, states that the largest of the famous Italian giant Caproni aeroplanes at Langley Field was partially wrecked there after falling 150 feet.

Lt. Emilio Resnati, the Italian pilot, saved the lives of himself and the 15 passengers in the big machine.

The aeroplane, with accommodation for 24 passengers, had made a beautiful flight, and was returning to the field, when it became unmanageable at an altitude of 1,000 feet, and fell towards the earth at a terrific speed.

Lt. Resnati manœuvred the car with such accuracy that it righted when close to the earth and shot round in a zig-zag course before striking the ground. It landed partly on its wings and partly on its wheels. The car was wrecked beyond all repair, except possibly the motors and wheels. It struck the earth with great force, but the passengers, owing to the remarkable skill of Lt. Resnati, who never left the wheel, were ready to jump.

Several of them were bruised, and Lt. Resnati himself was bruised about the head.

#### ENEMY ADVERTISING.

This Journal is conducted in the interests of British Industry and of commercial and technical intercourse between the British Dominions and friendly Nations. Subject to the conditions of Peace, its pages will not be available for assisting the recovery of markets for German and Austrian goods.



## The Honours List of R.F.C. in 1917.

### THE VICTORIA CROSS.

Feb. 12th.

No. 1396 Serjt. THOMAS MOTTERSHEAD, late R.F.C.

For most conspicuous bravery, endurance, and skill when, attacked at an altitude of 9,000 feet, the petrol tank was pierced and the machine set on fire.

Enveloped in flames, which his observer, Lt. Gower was unable to subdue, this very gallant soldier succeeded in bringing his aeroplane back to our lines, and though he made a successful landing, the machine collapsed on touching the ground, pinning him beneath wreckage from which he was subsequently rescued.

Though suffering extreme torture from burns, Serjt. Mottershead showed the most conspicuous presence of mind in the careful selection of a landing-place, and his wonderful endurance and fortitude undoubtedly saved the life of his observer.

He has since succumbed to his injuries.

June 9th.

Lt. (temp. Capt.) ALBERT BALL, D.S.O., M.C., late Notts and Derby R., and R.F.C.

For most conspicuous and consistent bravery from April 25th to May 6th, 1917, during which period Capt. Ball took part in 26 combats in the air and destroyed 11 hostile aeroplanes, drove down two out of control, and forced several others to land.

In these combats Capt. Ball, flying alone, on one occasion fought six hostile machines, twice he fought five, and once four. When leading two other British aeroplanes he attacked an enemy formation of eight. On each of these occasions he brought down at least one enemy.

Several times his aeroplane was badly damaged, once so seriously that but for the most delicate handling his machine would have collapsed, as nearly all the control wires had been shot away. On returning with a damaged machine he had always to be restrained from immediately going out on another.

In all Capt. Ball has destroyed 43 German aeroplanes and one balloon, and has always displayed most exceptional courage, determination, and skill.

Lt. FRANK HUBERT McNAMARA, Aus. Forces, R.F.C.

For most conspicuous bravery and devotion to duty during an aerial bomb attack upon a hostile construction train, when one of our pilots was forced to land behind the enemy's lines.

Lt. McNamara, observing this pilot's predicament, and the fact that hostile cavalry were approaching, descended to his rescue. He did this under heavy rifle fire, and in spite of the fact that he himself had been severely wounded in the thigh.

He landed about 200 yards from the damaged machine, the pilot of which climbed on to Lt. McNamara's machine, and an attempt was made to rise. Owing, however, to his disabled leg Lt. McNamara was unable to keep his machine straight, and it turned over. The two officers, having extricated themselves, immediately set fire to the machine and made their way across to the damaged machine, which they succeeded in starting.

Finally, Lt. McNamara, although weak from loss of blood, flew this machine back to his aerodrome, a distance of 70 miles, and thus completed his comrade's rescue.

Aug. 11th.

Capt. WILLIAM AVERY BISHOP, D.S.O., M.C., Canadian Cavalry and R.F.C.

For most conspicuous bravery, determination, and skill.

Capt. Bishop, who had been sent out to work independently, flew first of all to an enemy aerodrome; finding no machine about, he flew on to another aerodrome about three miles south-east, which was at least 12 miles the other side of the line. Seven machines, some with their engines running, were on the ground. He attacked these from about 50 ft., and a mechanic, who was starting one of the engines, was seen to fall. One of the machines got off the ground, but at a height of 60 ft. Capt. Bishop fired 15 rounds into it at very close range, and it crashed to the ground.

A second machine got off the ground, into which he fired 30 rounds at 150 yards range and it fell into a tree.

Two more machines then rose from the aerodrome. One of these he engaged at the height of 1,000 ft., emptying the rest of his drum of ammunition. This machine crashed 300 yards from the aerodrome, after which Capt. Bishop emptied a whole drum into the fourth hostile machine, and then flew back to his station.

Four hostile scouts were about 1,000 ft. above him for about a mile of his return journey, but they would not attack.

His machine was very badly shot about by machine-gun fire from the ground.

### THE ORDER OF THE BATH.

Dec. 31st.

K.C.B. (MILITARY DIVISION).

Maj.-Gen. HUGH MONTAGUE TRENCHARD, C.B., D.S.O.

### THE ORDER OF ST. MICHAEL AND ST. GEORGE.

Jan. 24th.

TO BE ADDITIONAL MEMBER OF THE THIRD CLASS, OR COMPANION, OF THE SAID MOST DISTINGUISHED ORDER:—

Maj. and Bt. Lt.-Col. (temp. Brig.-Gen.) DUNCAN SAYRE MACINNES, D.S.O., R.E.

June 2nd.

C.M.G. (ADDITIONAL).

Maj. and Bt. Lt.-Col. (temp. Brig.-Gen.) J. M. SALMOND, D.S.O., R. Lanc. R. and R.F.C.

Maj. (temp. Lt.-Col.) G. LIVINGSTON, Lond. R. and R.F.C.

Dec. 31st.

C.M.G.

Maj. and Bt. Lt.-Col. (temp. Brig.-Gen.) TOM INCE WEBB-BOWEN, Bedf. R.

Maj. and Bt. Lt.-Col. (temp. Brig.-Gen.) DUNCAN LE GRAY PITCHER, Ind. A.

Maj. (temp. Lt.-Col.) JAMES GEORGE WEIR, R.F.A.

Capt. (temp. Col.) CECIL HENRY WHITTINGTON, R.F.C., S.R.

### THE DISTINGUISHED SERVICE ORDER.

Jan. 10th.

Sec. Lt. NORMAN BREARLEY, M.C., L'pool R. and R.F.C.

With another pilot he gallantly attacked seven hostile machines. Later, although severely wounded, he displayed great courage and determination in reaching our own lines.

Capt. GEORGE ALEC PARKER, M.C., North'n R. and R.F.C.

He attacked hostile aeroplanes on three occasions during the same flight, killing an enemy observer. On another occasion he drove off three enemy machines, pursuing one of them down to 750 ft. three miles behind the enemy's lines.

Jan. 24th.

Capt. (temp. Maj.) M. G. CHRISTIE, M.C., R.F.C., Spec. Res.

Feb. 1st.

SOUTH AFRICAN FORCES.—Temp. Maj. GERARD PERCY WALLACE, Capt. S. Afr. Def. Force and R.F.C.

March 3rd.

Sec. Lt. (temp. Capt.) GEORGE CYRIL BAILEY, R.F.C., Spec. Res.

He co-operated in an infantry raid by flying over the enemy's trenches at a height of only 1,500 ft. for more than an hour and a half in very adverse weather conditions. He attacked the enemy in the trenches with machine-gun fire, and located sixteen active enemy batteries during the flight. He has repeatedly done fine work.

Lt. (temp. Capt.) JUSTIN HOWARD HERRING, M.C., R.F.C., Spec. Res.

He displayed great courage and initiative in bombing an enemy gunboat which was towing a bridge upstream. He flew continuously for six hours under heavy rifle fire, and seriously harassed the enemy by preventing his bridging operations. On another occasion he carried out a successful raid and brought back most valuable information.

Bt. Lieut.-Col. (temp. Brig.-Gen.) WILLIAM GEOFFREY HANSON SALMOND, R.A. and R.F.C.

For conspicuous ability and devotion to duty when personally directing the work of the Royal Flying Corps during the action. The striking success attained was largely due to his magnificent personal example.

March 12th.

Lt. (temp. Capt.) SELDEN HERBERT LONG, M.C., Durh. L.I. and R.F.C.

For great skill and daring in piloting his machine. He shot down an enemy machine, which fell in our lines, and the same day he forced another hostile machine to land in the enemy's lines. Later, he shot down another enemy machine, which fell in our lines.

March 17th.

Capt. (temp. Maj.) HERWARD DE HAVILLAND, R.F.C., Spec. Res.

He attacked and drove down a hostile machine. This is the second enemy machine he has destroyed. He has rendered invaluable service throughout the operations, and has at all times set a magnificent example.



## THE HONOURS LIST OF R.F.C. IN 1917.

## The Distinguished Service Order (continued),

May 26th.

Temp. Sec. Lt. CLIVE OLIVER BERTRAM BEALE, Gen. List and R.F.C.

He made two most gallant attempts to carry out a special mission, which involved a night flight of about 50 miles, in very adverse weather. Although unsuccessful, he showed throughout the greatest courage and determination to achieve his mission.

Temp. Sec. Lt. (temp. Capt.) AUGUSTUS WIELAND BIRD, Gen. List and R.F.C.

For conspicuous gallantry and devotion to duty on many occasions. When on artillery patrol he succeeded in reporting 13 active batteries, observing fire on and silencing several of them. On another occasion he attacked and scattered with machine-gun fire two parties of the enemy which were seen forming-up. This operation was carried out for a period of 2½ hours in very adverse weather conditions.

June 2nd.

Temp. Capt. W. W. BENN, Yeo., attd. R.N.A.S.

Capt. (temp. Lt.-Col.) the Hon. J. D. BOYLE, Rif. Brig. and R.F.C.

Lt. (temp. Maj.) R. A. COOPER, Yeo. and R.F.C. (late Capt., D.G.).

Capt. (temp. Maj.) L. F. R. FELL, R.F.C., Spec. Res.

Maj. A. L. GODMAN, York. R. and R.F.C.

Capt. (temp. Maj.) J. H. A. LANDON, Essex R. and R.F.C.

Capt. (temp. Lt.-Col.) R. LORAIN, M.C., R.F.C., Spec. Res.

Capt. and Bt.-Maj. (temp. Brig.-Gen.) G. S. SHEPARD, M.C., R. Fus., attd. R.F.C.

Capt. (temp. Maj.) J. VALENTINE, R.F.C., Spec. Res.

Capt. (temp. Lt.-Col.) P. K. WISE, R. War. R. and R.F.C.

June 18th.

Capt. WILLIAM AVERY BISHOP, Can. Cav. and R.F.C.

While in a single-seater he attacked three hostile machines, two of which he brought down, although in the meantime he was himself attacked by four other hostile machines. His courage and determination have set a fine example to others.

Temp. Sec. Lt. (temp. Capt.) GILBERT WARE MURLIS GREEN, M.C., R.F.C.

He has set a magnificent example by his gallant conduct in attacking the enemy's aeroplanes when in superior numbers. He brought down three enemy machines within 24 hours.

July 18th.

Lt. (temp. Maj.) LEONARD WRIGHT LEARMOUNT, M.C., Gen. List and R.F.C., Spec. Res.

He has shown great skill and determination when on photographic reconnaissances. Despite continuous fire from the ground and attack from hostile aircraft, he has repeatedly effected a safe landing after completing his task.

Temp. Lt. (temp. Capt.) CHARLES FREDERICK ALGERNON PORTAL, M.C., Spec. Res., and R.F.C.

For many months he has done magnificent work in co-operation with the artillery. During an attack he succeeded in silencing nine active hostile batteries, ranging our artillery. His splendid example has been of the greatest value.

July 26th.

Sec. Lt. (temp. Capt.) JOHN OLIVER ANDREWS, M.C., R. Scots and R.F.C.

For conspicuous gallantry and devotion to duty in leading offensive patrols with great dash and success on over 30 occasions, and taking part in over 22 combats. His skill and courage in attacking and destroying hostile aircraft have at all times been magnificent.

Sec. Lt. SAMUEL HOLLIS ALFRED D'ARCY, R.F.C., Spec. Res.

For conspicuous gallantry and devotion to duty, in continually attacking and dispersing hostile infantry and transport from a very low altitude. Whilst engaged in this he was wounded, but refused to return until he was almost unconscious. He also showed great courage and determination on several occasions in attacking hostile aircraft, destroying some and forcing others to descend.

Aug. 16th.

## AUSTRALIAN IMPERIAL FORCE.

Capt. RICHARD WILLIAMS, F.C.

Flying at a low altitude under intense anti-aircraft fire, he attacked and dispersed enemy troops who were concentrating on our flank. On another occasion, whilst on a reconnaissance, he landed in the enemy lines and rescued a pilot of a machine which had been brought down by hostile fire.

Aug. 25th.

Temp. Lt. FRED PARKINSON HOLLIDAY, Gen. List and R.F.C.

By his initiative and skilful manoeuvring he led six hostile machines to an encounter with our own formation, during which five out of the six hostile machines were destroyed and driven down. He had been equally successful the day before

in misleading hostile aircraft, and his originality and fearless example were of the greatest value to his squadron.

Sept. 17th.

Maj. (temp. Lt.-Col.) NORMAN DUCKWORTH KERR MACEWEN, Arg. and Suthd. Highrs. and R.F.C.

Sec. Lt. (temp. Capt.) WILLIAM CHARLES CAMPBELL, M.C., R.F.C., Spec. Res.

For conspicuous gallantry and devotion to duty on numerous occasions whilst on offensive patrols. He has displayed the greatest courage and skill in attacking enemy aircraft at close range, destroying some and driving others down out of control. He has proved himself to be a scout leader of the highest class, and has destroyed 12 hostile machines and two balloons, besides taking part in many other combats during the last three months. By his fearlessness and offensive spirit he has set a splendid example to all ranks.

Lt. (temp. Capt.) WILLIAM JOHN CHARLES KENNEDY-COCHRAN-PATRICK, M.C., Rif. Bde. and R.F.C.

For conspicuous gallantry and devotion to duty on numerous occasions in destroying and driving down hostile machines, frequently engaging the enemy with great dash and a fine offensive spirit when encountered in superior numbers. By his cool judgment and splendid fearlessness he has instilled confidence in all around him, his brilliant leadership being chiefly responsible for his numerous successes.

Sec. Lt. (temp. Capt.) HAROLD MELSOME PROBYN, R. War. R., and R.F.C.

At a critical time when hostile infantry had penetrated our trenches, he went up in unfavourable weather and under heavy machine-gun and anti-aircraft fire from guns of heavy calibre and managed to locate and report with complete accuracy the position and progress of the enemy. To do this he had to fly at a very low altitude, during which his machine was seriously damaged by enemy fire. The following day he carried out another daring and successful reconnaissance of the enemy's lines, bringing back information of the greatest value. He has already experienced a whole year's strenuous service flying, a fact which speaks for his gallantry and endurance on both of these particular occasions.

Sec. Lt. ALFRED SEYMOUR SHEPHERD, M.C., R.F.C., Spec. Res.

For conspicuous gallantry and devotion to duty on numerous occasions when engaged in combat with hostile aircraft. Though surrounded by enemy machines, he continued to fight for nearly an hour with the utmost gallantry and determination against two hostile formations, finally bringing down one of the enemy out of control. Within a month he brought down seven hostile machines completely out of control.

Lt. (temp. Capt.) JOHN WHITAKER WOODHOUSE, M.C., R.F.C., Spec. Res.

For conspicuous gallantry and devotion to duty in carrying out special missions by night, during which he has frequently been compelled to face very bad weather. In the course of numerous bombing expeditions by night he invariably descended to very low altitudes in order to use his machine gun against hostile troops on the roads. He has consistently set a very fine example.

Sept. 26th.

Sec. Lt. (temp. Capt.) A. CONINGHAM, M.C., R.F.C., Spec. Res.

Temp. Sec. Lt. W. F. LEECH, Gen. List and R.F.C.

Lt. (temp. Capt.) R. J. LOWCOCK, M.C., Notts and Derby R. and R.F.C.

Sec. Lt. (temp. Capt.) B. E. SUTTON, M.C., Yeo., and R.F.C.

Temp. Maj. E. J. TYSON, M.C., Gen. List and R.F.C.

Sec. Lt. C. W. WARMAN, M.C., Gen. List and R.F.C.

Oct. 27th.

Sec. Lt. A. P. F. RHYS-DAVIDS, M.C., R.F.C., Spec. Res.

## FOR ANTI-AIRCRAFT SERVICES.

Dec. 18th.

Lt.-Col. W. M. THOMPSON, R.E.

Temp. Capt. W. H. HAYNES, R.F.C.

Jan. 1st, 1918.

Sec. Lt. (T. Maj.) RICHARD GRAHAM BLOMFIELD, Gds. and R.F.C.

Maj. (T. Lt.-Col.) ANDREW GEORGE BOARD, S. W. Bord. and R.F.C.

Capt. (T. Lt.-Col.) HAROLD BURCHALL, R.F.C., Spec. Res.

Temp. Lt.-Col. the Hon. ANTONY SCHOMBERG BYNG, D.S.O., Gen. List and R.F.C.

Maj. (T. Lt.-Col.) ALAN DOUGLAS CARDEN, R.E. and R.F.C.

Capt. (T. Lt.-Col.) ARCHIBALD CHRISTIE, R.A. and R.F.C.

Capt. (T. Lt.-Col.) RICHARD HAMILTON COLLIER, R.F.C., Spec. Res.

• Capt. EDWARD ROUX LITLEDALE CORBALLIS, R. Dub. Fus., and R.F.C.

Maj. ALAN SYDNEY WHITEHORN DORE, Worc. R. and R.F.C.

Capt. (T. Maj.) GEORGE PASCOE GRENFELL, R.F.C., Spec. Res.

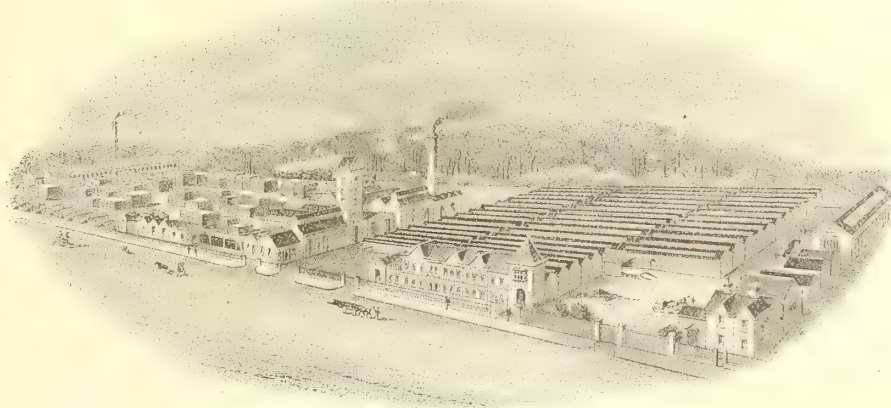
Wing Cmdr. FREDERICK CROSBY HALAHAN, M.V.O., R.N.A.S. (For service with the R.F.C.)



# WM. LAWRENCE & CO., LTD.

(WHOLESALE FURNITURE MANUFACTURERS.)

## AIRCRAFT WORKS.



WORKS COVERING OVER 8 ACRES.

COLWICK, NOTTINGHAM.



N.B.—WE ARE LARGE BUYERS OF MATERIALS  
AND METAL-WORK FOR OUR SHORTS,  
FAIREY-CAMPANIA, & HANDLEY-PAGE  
CONTRACTS.

TELEPHONE :  
No. 18 CARLTON (Priv. Branch Exchange).



TELEGRAMS :  
"FURNITURE, NETHERFIELD."

## THE HONOURS LIST OF R.F.C. IN 1917.

**The Distinguished Service Order (continued).**

Maj. LEOLINE JENKINS, M.C., Dorset R.G.A. and R.F.C.  
 Capt. (T. Maj.) JOHN LAWSON KINNEAR, M.C., L'pool R. and R.F.C.  
 Capt. and Bt. Lt.-Col. (T. Brig.-Gen.) CHARLES ALEXANDER HOLCOMBE LONGCROFT, Welsh R.  
 Capt. and Bt. Maj. (T. Lt.-Col.) EDGAR RAINEY LUDLOW-HEWITT M.C., R. Ir. Rif.  
 Lt. Comdr. EDWARD N. GROVES MORRIS, R.N.V.R., attd. R.N.A.S.  
 Lt. OLIVER G. G. VILLIERS, R.N.V.R., attd. R.N.A.S.  
 Temp. Maj. CHARLES SANDFORD WYNNE EYTON, Gen. List and R.F.C.

**CANADIAN FORCE.**

Lt. (A. Maj.) ARTHUR CLINTON MAUND, Inf. and R.F.C.  
 Lt. (T. Maj.) FREDERICK FRANK MINCHIN, M.C., Inf., attd. R.F.C. Spec. Res.

**A Bar to the Distinguished Service Order.**

May 26th.  
 Lt. (temp. Capt.) ALLAN MACHIN WILKINSON, D.S.O., Hamp. R. and R.F.C.

He came down to a low altitude and destroyed a hostile scout which was attacking one of our machines, the pilot of which had been wounded, thereby saving it. In one day he shot down and destroyed six hostile machines. He has destroyed eight hostile machines during the past 10 days, and has displayed exceptional skill and gallantry in leading offensive patrols (D.S.O. gazetted Oct. 20th, 1916.)

Aug. 8th.

Maj. ARTHUR JUSTIN ROSS, D.S.O., R.E. and R.F.C.

**A Second Bar to the Distinguished Service Order.**

July 18th.  
 Capt. CHARLES EDGAR BRYANT, D.S.O., Lts. and R.F.C.  
 He has displayed the utmost gallantry and skill in leading photographic reconnaissances. In spite of overwhelming opposition by hostile aircraft, he has never failed to carry out his difficult task. (D.S.O. gazetted Feb. 18th, 1915.)

**THE MILITARY CROSS.**

Jan. 10th.  
 Temp. Sec. Lt. WILLIAM GEORGE BARKER, Gen. List and R.F.C.  
 Lt. (temp. Capt.) JOHN A. G. DE COURCY, R.G.A. and R.F.C.  
 Lt. (temp. Capt.) CHARLES HERBERT DIXON, York L.I., Spec. Res. and R.F.C.  
 Temp. Lt. ARNOLD LAWSON HARROW-BUNN, Notts and Derby R.  
 Capt. GUY MURTON MOORE, R. Berks R. and R.F.C.  
 Capt. GEORGE ALEC PARKER, D.S.O., North'n R. and R.F.C.  
 Sec. Lt. (temp. Capt.) WILLIAM GORDON PENDER, Spec. Res. R.F.C.  
 Temp. Lt. (temp. Capt.) CHARLES F. A. PORTAL, R.E., Spec. Res. and R.F.C.  
 Sec. Lt. (temp. Lt.) WILLIAM HERVEY ALLEN WHITWORTH, Dorset R. and R.F.C.

**CANADIAN FORCE.**

Lt. FREDERICK GEORGE HERBERT MANVILLE, Can. Inf. and R.F.C.  
 Jan. 24th.  
 Lt. (temp. Capt.) R. C. LYON HOLME, Som. L.I. and R.F.C.  
 Lt. (temp. Capt.) HENRY STEWART POWELL, Ceylon Rif. and R.F.C.

Jan. 26th.

Capt. RUSSELL HERBERT FREEMAN, Worcester Regt., Spec. Res. and R.F.C.

Feb. 1st.

Sec. Lt. (temp. Capt.) GERARD WILLIAM HODGKINSON, Yeo. and R.F.C.  
 Sec. Lt. BERNARD HENRY ESME HOWARD, Manch. R., Spec. Res. and R.F.C.  
 Sec. Lt. (temp. Lt.) GEORGE ST. VINCENT PAWSON, Yeo. and R.F.C.

**SOUTH AFRICAN FORCES.**

Lt. LIONEL COHEN, S. Afr. Horse (attd. R.N.A.S.)  
 Temp. Capt. EDWIN CHEERE EMMETT, temp. Lt., S.A. Def. Force and R.F.C.

Feb. 13th.

Sec. Lt. (temp. Lt.) EDWIN LOUIS BENBOW, R.F.A. and R.F.C.  
 Sec. Lt. (temp. Capt.) JOSEPH CRUESS CALLAGHAN, R. Muns. Fus. and R.F.C.

Lt. (temp. Capt.) ARTHUR RAMSAY STANLEY CLARKE, Dorset R. and R.F.C.

Temp. Capt. JOHN BOWLEY QUESTED, R.F.C.

Feb. 15th.

Capt. (temp. Maj.) JOHN THEODORE CUTHBERT MOORE-BRABAZON, R.F.C., S.R.

March 1st.

Temp. Sec. Lt. ALIAN DENISON, Gen. List and R.F.C.  
 Temp. Capt. WILLIAM JAMES YULE GUILFOYLE, R.F.C.  
 Temp. Sec. Lt. (temp. Lt.) SHIRLEY GEORGE KINGSLEY, Gen. List and R.F.C.

Lt. GERALD MERTON, R.F.C., Spec. Res.

Temp. Sec. Lt. (temp. Lt.) STANLEY KEITH MUIR, Gen. List and R.F.C.

Sec. Lt. (temp. Lt.) ELMER PETER ROBERTS, R. Suss. R. and R.F.C.

Lt. WALTER SOMERVILLE SCOTT, Lan. Fus. and R.F.C.

Temp. Sec. Lt. LEWIS SCOTT WHITE, Gen. List and R.F.C.

March 12th.

Sec. Lt. CREIL GORDON-DAVIS, N. Staff. R. and R.F.C.

Capt. ROBERT MILLINGTON KNOWLES, Norf. R., Spec. Res., and R.F.C.

Sec. Lt. JAMES THOMAS BYFORD MCCUDDEN, Gen. List and R.F.C. March 17th.

Lt. JAMES RATTRAY BURNS, Sco. Rif. and R.F.C.

March 26th.

Temp. Sec. Lt. JOHN WILLIAM ALDRED, R. Lanc. R. and R.F.C.

Lt. DOUGLAS HUGH MOFFATT CARBERY, R.F.A. and R.F.C.

Lt. (temp. Capt.) HUBERT WILLIAM GODFREY JONES, Welsh R. and R.F.C.

Sec. Lt. WILFRID RIPPON SNOW, R.F.C., Spec. Res.

April 17th.

Lt. THOMAS GERALD GLYNN BOLITHO, R.F.C., Spec. Res.

Sec. Lt. (temp. Lt.) CHARLES FFOLLIOTT DENNING, R.W. Surrey R., Spec. Res., and R.F.C.

Sec. Lt. (temp. Lt.) OSBERT RICHMOND KNIGHT, R.W. Surrey R., and R.F.C.

Sec. Lt. (temp. Capt.) JAMES LEITH LEITH, Hampshire R., and R.F.C.

Lt. WILLIAM GEOFFREY MEGGITT, Welsh R., Spec. Res. and R.F.C.

Lt. GEORGE KENNETH SIMPSON, R.F.C., late R.G.A., Gen. List.

April 26th.

Sec. Lt. (temp. Capt.) CHRISTOPHER JOSEPH QUINTIN BRAND, R.F.C., Spec. Res.

Lt. JAMES RATTRAY BURNS, Sco. Rif. and R.F.C.

Sec. Lt. (temp. Lt.) WILLIAM SAMUEL CASTER, Cyclist Bn. and R.F.C.

Temp. Sec. Lt. GEORGE COURTENAY DELL-CLARKE, Gen. List and R.F.C.

Temp. Lt. LEONARD DODSON, Gen. List and R.F.C.

Sec. Lt. (temp. Lt.) HAROLD FORRESTER DUNCAN, High. L.I. and R.F.C.

Sec. Lt. (temp. Lt.) CHARLES EDWARD MURRAY PICKTHORN, A.S.C., Spec. Res. and R.F.C.

**AUSTRALIAN IMPERIAL FORCE.**

Capt. ALLAN MURRAY JONES, F.C.

May 11th.

Temp. Sec. Lt. WILLIAM BAILLIE, Gen. List and R.F.C.

Sec. Lt. EDMUND BARRY CAHUSAC, S. Staff. R., Spec. Res., attd. R.F.C.

Capt. DOUGLAS REGINALD GAWLER, R. Scots and R.F.C.

Sec. Lt. ROBERT HAMILTON, High. Cyclist Bn., attd. R.F.C.

Temp. Sec. Lt. WILLIAM DRUMMOND MATHESON, Gen. List and R.F.C.

Temp. Capt. LANCELOT LYTTON RICHARDSON, Gen. List and R.F.C.

Lt. (temp. Capt.) DONALD CAMPBELL RUTTER, R. Suss. R., Spec. Res. and R.F.C.

**AUSTRALIAN IMPERIAL FORCE.**

Sec. Lt. REGINALD FRANCIS BOILLEAU, R.F.C.

Lt. ROSS MACPHERSON SMITH, Aust. Light Horse R., attd. Aust. R.F.C.

May 26th.

Sec. Lt. (temp. Lt.) LAURENCE WILFRED ALLEN, R. War. R., attd. R.F.C.

Lt. (temp. Capt.) HAROLD HARRINGTON BALFOUR, K.R.R.C., Spec. Res. and R.F.C.

Temp. Lt. (temp. Capt.) ALAN BINNIE, Gen. List and R.F.C.

Sec. Lt. WILLIAM BUCKINGHAM, R.F.C., Spec. Res.

Sec. Lt. WALTER WILLIAM GLENN, R.F.A. and R.F.C.

Temp. Lt. ERNEST GEORGE GREEN, R.E. and R.F.C.

Sec. Lt. LIONEL BAKER JONES, Welsh R. and R.F.C.

Temp. Lt. PHILIP JAMES VAUGHAN LAVARACK, Gen. List and R.F.C.

Lt. (temp. Capt.) JOHN HAMILTON NORTON, Gen. List and R.F.C.

Sec. Lt. (temp. Capt.) FRANK LAWRENCE JAMES SHIRLEY, York R. and R.F.C.

Sec. Lt. GEORGE RONALD YORSTON STOUT, A. and S. Highrs., attd. R.F.C.

Capt. JOHN THOMAS WALLER, Leic. R. and R.F.C.

**CANADIAN FORCE.**

Lt. WILLIAM AVERY BISHOP, Can. Cav. and R.F.C.

June 4th.

Sec. Lt. (temp. Capt.) G. B. A. BAKER, R. Berks R. and R.F.C.

Sec. Lt. R. E. BUCKINGHAM, R.F.C., Spec. Res.

Temp. Capt. W. W. CAREY-THOMAS, Gen. List and R.F.C.

Sec. Lt. (temp. Lt.) F. O. CAVE, Rif. Bde. and R.F.C.

Temp. Capt. J. CLISDAL, Gen. List and R.F.C.

Temp. Capt. E. J. HENDERSON, R.F.C., S.R.



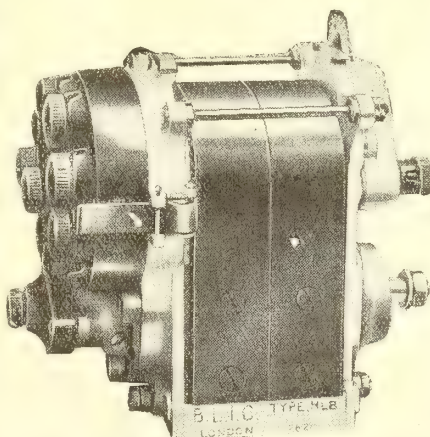


THE HEART OF THE AEROPLANE—  
the vital centre of its power unit—is undoubtedly  
the magneto. Failure there must be unthinkable!  
That is why the "B.L.I.C." Magneto is supreme—  
its absolute reliability may be taken for granted!

# B.L.I.C.

THE BRITISH LIGHTING & IGNITION CO. LTD.

THE BRITISH  
LIGHTING & IGNITION  
Co., Ltd.



204, Tottenham Court  
Road, London, W 1  
Proprietors: VICKERS, Ltd.



## THE HONOURS LIST OF R.F.C. IN 1917.

## The Military Cross (continued).

Temp. Capt. C. HOLLAND, R.F.C., Spec. Res.  
 Temp. Sec. Lt. P. C. HOLLINGSWORTH, Gen. List and R.F.C.  
 Temp. Lt. (temp. Capt.) H. D. JENSEN, Gen. List and R.F.C.  
 Sec. Lt. E. KING, K.O.S.B., Spec. Res., attd. R.F.C.  
 Sec. Lt. M. J. J. G. MARE-MONTEBAULT, Yeo. and R.F.C.  
 Sec. Lt. (temp. Capt.) H. M. MASSEY, Notts and Derby R. and R.F.C.

Temp. Capt. H. MEINTJES, Gen. List and R.F.C.  
 Temp. Lt. F. G. SAUNDERS, Gen. List and R.F.C.  
 Sec. Lt. F. H. B. SELOUS, R.W. Surr. R. and R.F.C.  
 Temp. Sec. Lt. (temp. Lt.) Actg. Flt. Comdr. E. R. WILKINSON, Gen. List and R.F.C.

Sec. Lt. (temp. Capt.) H. A. WOOD, R.F.C., Spec. Res.

## CANADIAN FORCES.

Lt. J. C. F. OWEN, Can. Local Forces and R.F.C.

June 18th.

Sec. Lt. DOUGLAS JOHN BELL, R.F.C., Spec. Res.  
 Temp. Sec. Lt. (temp. Capt.) BEAUCHAMP ST. JOHN BOULTBEE, Gen. List and R.F.C.

Sec. Lt. EDWIN STEWART TRAVIS COLE, R.F.C., Spec. Res.  
 Temp. Sec. Lt. HAROLD EBORALL DAVIS, Gen. List and R.F.C.  
 Temp. Sec. Lt. HERBERT GEORGE DOWNING, Gen. List and R.F.C.

Temp. Sec. Lt. HENRY ERNEST KARSLAKE ECCLES, Gen. List and R.F.C.

Temp. Sec. Lt. ARCHIRALD CECIL HEAVEN, Gen. List and R.F.C.  
 Temp. Sec. Lt. WILLIAM LEWIS HUGHES, Durh. L.I.

Sec. Lt. (temp. Capt.) NORMAN GEORGE McNAUGHTON, Gen. List and R.F.C., Spec. Res.

Temp. Lt. THOMAS GEORGE POLAND, E. Surr. R. and R.F.C.

Lt. (temp. Capt.) BERNARD CURTIS RICE, Gen. List and R.F.C.

Temp. Capt. GEORGE SAMUEL SANSON, R.F.C., Spec. Res.

Lt. VICTOR HENRY HUSTON, Canadian A.S.C. and R.F.C.

June 30th.

Capt. R. H. M. S. SAUNDBY, R. Warwick R. and R.F.C.

Sec. Lt. L. P. WATKINS, Canadian Inf. and R.F.C. (Both for Anti-Aircraft Service.)

July 17th.

Capt. JOHN PALETHORPE, R.F.C.

July 18th.

Lt. JAMES DACRES BELGRAVE, Oxf. and Bucks L.I. and R.F.C.

Sec. Lt. MAURICE ARTHUR BENJAMIN, R.F.C., Spec. Res.

Sec. Lt. EDWIN LESLIE BISHOP, Worc. R., Spec. Res., attd. R.F.C.

Sec. Lt. CHARLES EDWARD BLAYNEY, R.F.C., Spec. Res.

Capt. CYRIL MARCONI CROWE, R.F.C., Spec. Res.

Capt. FRANCIS RICHARD CUBBON, I.A., attd. R.F.C.

Temp. Capt. HAROLD FOWLER, Gen. List and R.F.C.

Temp. Sec. Lt. CECIL STUART GOODFELLOW, Gen. List and R.F.C.

Lt. (temp. Capt.) LIONEL THOMAS NUTCOMBE GOULD, R.A. and R.F.C.

Temp. Sec. Lt. (temp. Capt.) JOHN BENJAMIN GRAHAM, Gen. List and R.F.C.

Temp. Sec. Lt. (temp. Capt.) ROBERT GREGORY, Conn. R., Spec. Res., attd. R.F.C.

Temp. Sec. Lt. WILLIAM HENRY GUNNER, Gen. List and R.F.C.

Sec. Lt. REGINALD THEODORE CARLOS HOIDGE, R.G.A., Spec. Res. and R.F.C.

Temp. Lt. RICHARD NEVILLE KENWARD JONES, Gen. List and R.F.C.

Sec. Lt. ARTHUR GORDON JONES-WILLIAMS, Welsh R. and R.F.C.

Sec. Lt. DOUGLAS STEWART KENNEDY, R.F.C. Spec. Res.

Temp. Sec. Lt. REGINALD GEORGE MALCOLM, Gen. List and R.F.C.

Temp. Capt. EYDE ROLLESTON MANNING, Gen. List and R.F.C.

Sec. Lt. (temp. Capt.) KENNETH CAMPBELL McCALLUM, Arg. and Suthd. Highrs., Spec. Res. and R.F.C.

Sec. Lt. LEWIS LAUGHARNE MORGAN, Welsh R., attd. R.F.C.

Lt. CHARLES ALLEN PARKER, R.F.A., Spec. Res. and R.F.C.

Sec. Lt. (temp. Capt.) LESLIE HURST PETER, R.E. and R.F.C.

Temp. Sec. Lt. WILLIAM THOMAS PRICE, R. War. R. and R.F.C.

Sec. Lt. ARTHUR PERCIVAL FOLEY RHYS-DAVIDS, R.F.C., Spec. Res.

Lt. (temp. Capt.) EDWARD ARTHUR BECKTON RICE, R.F.C., Spec. Res.

Sec. Lt. ALFRED SCOTT, R.F.A. and R.F.C.

Temp. Sec. Lt. (temp. Capt.) JOHN KENNETH SUMMERS, Gen. List and R.F.C.

Lt. (temp. Capt.) FREDERICK JAMES HARRY THAYNE, R.F.C., Spec. Res.

Temp. Capt. ANTHONY HERBERT WILLIAM WALL, Middx. R. and R.F.C.

Temp. Sec. Lt. EDMOND PERCY WILMOT, Gen. List and R.F.C.

## AUSTRALIAN IMPERIAL FORCE.

Sec. Lt. (temp. Capt.) WILFRED ASHTON McCLOUGHRY, Aus. L. Horse, attd. R.F.C.

## CANADIAN FORCE.

Capt. JOSEPH ACHILLE LE ROYER, Can. Infy. and R.F.C.

July 26th.

Sec. Lt. (temp. Lt.) ROBERT STANLEY AITKEN, R.G.A. and R.F.C.

Sec. Lt. VALENTINE HENRY BAKER, Gen. List and R.F.C.

Sec. Lt. GILES NOBLE BLENNERHASSETT, R. Ir. Fus., Spec. Res. and R.F.C.

Sec. Lt. HAMILTON BLOFELD, R.F.C., Spec. Res.

Sec. Lt. (temp. Lt.) JOCELYN ERNLE SYDNEY PATTON BRADFORD, W. Rid. R. and R.F.C.

Temp. Sec. Lt. GEOFFREY HORNBLLOWER COCK, Gen. List and R.F.C.

Sec. Lt. (temp. Lt.) STANFORD GAVIN, Devon R. and R.F.C.

Temp. Sec. Lt. ALBERT EARL GODFREY, Gen. List and R.F.C.

Lt. ROBERT BOLTON HAY, W. York. R., Spec. Res. and R.F.C.

Temp. Lt. THOMAS FALCON HAZELL, Gen. List and R.F.C.

Temp. Lt. FRED PARKINSON HOLLIDAY, Gen. List and R.F.C.

Sec. Lt. JEFFREY BATTERS HOME-HAY, Arg. and Suthd. Highrs. and R.F.C.

Temp. Sec. Lt. GEOFFREY KNIGHT, Gen. List and R.F.C.

Sec. Lt. MATTHEW LAURENCE MAGUIRE, Conn Rang. and R.F.C.

Sec. Lt. (temp. Capt.) REGINALD GEORGE HEWITT PIXLEY, R.F.A. and R.F.C.

Sec. Lt. ROBERT WOLSTENHOLME REID, R.F.C., Spec. Res.

Capt. (temp. Maj.) ALAN JOHN LANCE SCOTT, Yeo. and R.F.C.

Lt. (temp. Capt.) JAMES GEOFFREY SELBY, R.F.A. and R.F.C.

Lt. OLIVER MANNERS SUTTON, S. Lanc. R., Spec. Res. and R.F.C.

Sec. Lt. PATRICK GORDON TAYLOR, R.F.C., Spec. Res.

Sec. Lt. (temp. Capt.) STANLEY WEDGEWOOD TAYLOR, R.F.C., Spec. Res.

Temp. Lt. ROBERT PARKER MUSGRAVE WHITHAM, North'd Fus. and R.F.C.

## CANADIAN FORCE.

Lt. ALBERT EDWARD PICKERING, Infy. and R.F.C.

Aug. 6th.

Sec. Lt. (temp. Lt.) FRANK DOUGLAS HOLDER, E. Kent R. and R.F.C.

(For Anti-Aircraft Service.)

Aug. 8th.

Lt. ERNEST AYSOGHE FLOYER, Ind. Army R. of O. and R.F.C.

Lt. THOMAS HENDERSON, R.E. and R.F.C.

Capt. THOMAS WESTROPP MULCAHY-MORGAN, R. Ir. Fus. and R.F.C.

Sec. Lt. WILLIAM GEORGE STAFFORD, Gen. List and R.F.C.

Sec. Lt. (temp. Lt.) DAVID NORRIE THOMSON, Yeo. and R.F.C.

Aug. 16th.

Sec. Lt. WILLIAM CHARLES CAMPBELL, R.F.C., Spec. Res.

Temp. Sec. Lt. ROY MAXWELL DRUMMOND, R.F.C., attd. Aust. C.

Temp. Lt. DUDLEY CHARLES EGLINGTON, R. Highrs. and R.F.C.

Temp. Sec. Lt. (temp. Lt.) WILLIAM MAYES FRY, Gen. List and R.F.C.

Temp. Sec. Lt. CUTHBERT COLIN GEMMILL GIRVAN, Lanc. Fus. and R.F.C.

Temp. Lt. LOUIS FLEEMING JENKIN, Gen. List and R.F.C.

Temp. Capt. ARTHUR WILLAN KEEN, Gen. List and R.F.C.

Sec. Lt. (temp. Capt.) JOHN HERBERT TOWNE LETTS, Linc. R. and R.F.C.

Temp. Sec. Lt. GEORGE FREDERICK LINES, Gen. List and R.F.C.

Sec. Lt. EVANS ALEXANDER MCKAY, R.F.C., Spec. Res.

Sec. Lt. ALFRED SEYMOUR SHEPHERD, R.F.C., Spec. Res.

Aug. 17th.

Sec. Lt. (temp. Capt.) WILLIAM ROBERT SARGENT WILBERFORCE, K.R.R.C., attd. R.F.C.

Sec. Lt. ARTHUR MOSTYN WRAY, E. Kent R. and R.F.C.

Sec. Lt. ADRIAN TREVORE COLE, F.C.

Aug. 25th.

Sec. Lt. (temp. Capt.) BRIAN EDMUND BAKER, Rif. Bde. and R.F.C.

Sec. Lt. LEONARD MONTEAGLE BARLOW, R.F.C., Spec. Res.

Lt. GEOFFREY SEBASTIAN BUCK, Lond. R. and R.F.C.

Temp. Sec. Lt. THOMAS CARLYON LUKE, R.E. and R.F.C.

Capt. GEORGE DE CHIERRI PIRIE, Sco. Rif., Spec. Res. and R.F.C.

Sec. Lt. (temp. Lt.) LIONEL MOSTYN WOODHOUSE, Yeo. and R.F.C.

Sept. 17th.

Temp. Lt. PERCY JOHN BARNETT, Gen. List and R.F.C.

Lt. (temp. Capt.) GEOFFREY HILTON BOWMAN, R. War. R., Spec. Res. and R.F.C.

Lt. (temp. Capt.) KEITH LOGAN CALDWELL, R.F.C., Spec. Res.

Sec. Lt. WILLIAM CHARLES CAMBRAY, R.F.C.

Sec. Lt. (temp. Capt.) ALFRED JOHN MICHELL CLARKE, Glouc. R., and R.F.C.

Sec. Lt. (temp. Capt.) ARTHUR CONINGHAM, R.F.C., Spec. Res.

Sec. Lt. JOHN CLIVE CURRIE, R.F.A., Spec. Res., attd. R.F.C.

Lt. (temp. Capt.) FRANK FERNHOUGH, R.F.A. and R.F.C.

Sec. Lt. (temp. Lt.) ARTHUR WILLOUGHBY FALLS GLENNY, A.S.C., and R.F.C.

Sec. Lt. (temp. Capt.) GEOFFREY HERBERT HOOPER, R.E., attd. R.F.C.



Jewellers



to H.M. The King.



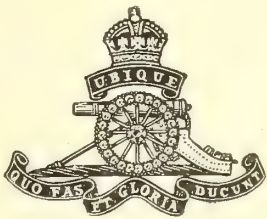
ROYAL FLYING CORPS BADGE BROOCH.

15-carat Gold and Enamel. Width  $2\frac{1}{2}$  ins.

£4 0 0.

GRENADEIER GUARDS  
BADGE BROOCH, fine  
Gold and Enamel.

£4 7 6.

With Diamond Cypher,  
£12 10 0.ROYAL ARTILLERY BADGE  
BROOCH, Gold and Enamel,  
with Rose Diamond Wheel.

£5 17 6.

15-carat Gold and Enamel,  
£5 5 0.ROYAL FLYING CORPS BADGE, set in Palladium,  
on Black Mouré Silk Bracelet.

£5 5 0.

## Military Jewellery

OF HIGHEST QUALITY.

THE Military Jewellery made by the Goldsmiths & Silversmiths Company is of finest quality, and is better value than can be obtained elsewhere. A fully illustrated Military Catalogue showing the comprehensive character of the Company's stock will be sent post free on application, or a Selection of Representative Badges will be submitted for approval if desired at the Goldsmiths & Silversmiths Company's risk.

The Goldsmiths & Silversmiths Company have no branch establishments in Regent Street, Oxford Street, or elsewhere—in London or abroad—only one address:

112, REGENT STREET, LONDON, W.1

THE  
GOLDSMITHS & SILVERSMITHS  
COMPANY LTD. with which is incorporated  
The Goldsmiths' Alliance Ltd. Estd. 1751.

112 Regent Street London W.1



## HERBERT KERSHAW & Co., Ltd.

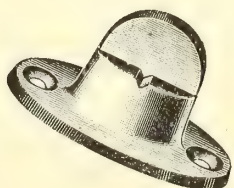
Contractors to H.M. Government.

### SPECIALITIES FOR AIRCRAFT:

LACING EYELETS.  
EYELETS AND RINGS (All Standard Sizes).  
HEART-SHAPED THIMBLES (All Sizes,  
Admiralty and Air Board Patterns).  
TURN BUTTONS AND EYELETS.  
SPUR TEETH GROMMETS, &c., &c.

Stampings in any Metal, made in quantities.  
Capstan Work. Enquiries solicited.

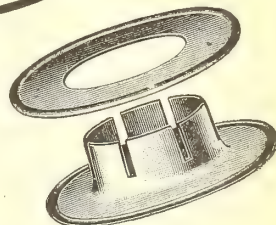
Registered Offices and Works:  
HIGHGATE WORKS, HIGHGATE STREET, BIRMINGHAM.



Telegrams:  
"DUPLEX,"  
BIRMINGHAM.

L  
A  
C  
I  
N  
GE  
Y  
E  
L  
E  
T

Telephone  
MIDLAND 511  
(Two Lines).



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

## THE HONOURS LIST OF R.F.C. IN 1917.

## The Military Cross (continued).

Temp. Sec. Lt. WALTER JAMES HODGSON-HORROCKS, Gen. List and R.F.C.  
 Sec. Lt. (temp. Lt.) CAMPBELL ALEXANDER HOY, R.F.C.  
 Lt. (temp. Capt.) RODERICK LEOPOLD KELLER, R. War. R., Spec. Res. and R.F.C.  
 Temp. Sec. Lt. EDWARD MANNOCK, R.E. and R.F.C.  
 Sec. Lt. ANDREW EDWARD MCKEEVER, R.F.C., Spec. Res.  
 Temp. Lt. (temp. Capt.) JOHN THEOBALD MILNE, Gen. List and R.F.C.  
 Sec. Lt. (temp. Capt.) RICHARD RAYMOND-BARKER, Gen. List and R.F.C.  
 Sec. Lt. ARCHIBALD CHARLES REEVES, R.F.C., Spec. Res.  
 Sec. Lt. CECIL ROY RICHARDS, R.F.C., Spec. Res.  
 Temp. Sec. Lt. (temp. Lt.) ALEXANDER ROULSTONE, Gen. List and R.F.C.  
 Temp. Capt. HENRY PHILIP RUSHFORTH, Gen. List and R.F.C.  
 Temp. Sec. Lt. (temp. Lt.) OWEN JOHN FREDERICK SCHOLTE, Gen. List and R.F.C.  
 Temp. Sec. Lt. CHARLES DOUGLAS SMART, Gen. List and R.F.C.  
 Sec. Lt. (temp. Capt.) DONALD FASKEN STEVENSON, Yeo. and R.F.C.  
 Lt. OLIVER STEWART, Middx R. and R.F.C.  
 Temp. Sec. Lt. RICHARD MICHAEL TREVETHAN, Gen. List and R.F.C.  
 Temp. Capt. ERNEST LESLIE WILLIAMS, Gen. List and R.F.C.  
 Sec. Lt. WALTER BERTRAM WOOD, Hamp. R. and R.F.C.  
 CANADIAN FORCE.  
 Lt. RICHARD DUNCAN, Mtd. Rif. and R.F.C.  
 Sept. 26th.  
 Sec. Lt. R. B. ASHCROFT, Notts and Derby R., Spec. Res. and R.F.C.  
 Temp. Sec. Lt. N. E. BARRACLOUGH, Gen. List and R.F.C.  
 Temp. Capt. A. BELL-IRVING, Gen. List and R.F.C.  
 Capt. R. B. BOURDILLON, R.F.C., Spec. Res.  
 Capt. A. BOYD, Sea. Highrs.  
 Temp. Lt. A. BOYLE, Gen. List and R.F.C.  
 Sec. Lt. G. T. W. BURKETT, R.F.C., Spec. Res.  
 Temp. Sec. Lt. R. M. BURNAND, Gen. List and R.F.C.  
 Sec. Lt. (temp. Lt.) J. CAIRNS, R.E. and R.F.C.  
 Lt. (temp. Capt.) C. F. COLLETT, R.F.C., Spec. Res.  
 Temp. Lt. G. B. CROLE, Gen. List and R.F.C.  
 Sec. Lt. W. L. DOUGLAS, London R. and R.F.C.  
 Sept. 26th.  
 Sec. Lt. (temp. Lt.) R. M. D. FAIRWEATHER, High. L.I., Spec. Res. and R.F.C.  
 Sec. Lt. (temp. Lt.) C. D. FELLOWES, R.F.C. and Yeo.  
 Temp. Capt. J. FITZ-MORRIS, Gen. List and R.F.C.  
 Temp. Sec. Lt. (temp. Capt.) P. F. FULARD, Gen. List and R.F.C.  
 Temp. Lt. F. J. GIBBS, S. Staffs R. and R.F.C.  
 Lt. E. GRIBBEN, R. Ir. Rif., Spec. Res., and R.F.C.  
 Temp. Sec. Lt. (temp. Lt.) B. C. R. GRIMWOOD, R.F.A. and R.F.C.  
 Sec. Lt. R. N. HALL, R.F.A., Spec. Res. and R.F.C.  
 Lt. (temp. Capt.) R. W. P. HALL, R.A.F. and R.F.C.  
 Sec. Lt. (temp. Capt.) H. R. HARKER, R.F.C., Spec. Res.  
 Sec. Lt. (temp. Capt.) S. G. HODGES, Wilts R. and R.F.C.  
 Temp. Sec. Lt. S. JOLLEY, Gen. List and R.F.C.  
 Lt. F. LEATHLEY, R. Innis. Fus. and R.F.C.  
 Sec. Lt. (temp. Lt.) G. M. LEES, R.G.A. and R.F.C.  
 Temp. Sec. Lt. T. A. M. S. LEWIS, Gen. List and R.F.C.  
 Lt. R. A. MAYBERY, Lrs. and R.F.C.  
 Temp. Capt. W. A. MCCLATCHIE, Gen. List and R.F.C.  
 Sec. Lt. D. U. MCGREGOR, R.F.C., Spec. Res.  
 Capt. W. T. MOLESWORTH, R. Mun. Fus. and R.F.C.  
 Lt. (temp. Capt.) K. D. P. MURRAY, R.F.C., Spec. Res.  
 Temp. Sec. Lt. A. R. H. NOSS, Gen. List and R.F.C.  
 Sec. Lt. C. S. O'GRADY, R.F.C., Spec. Res.  
 Sec. Lt. K. R. PARK, R.F.A. and R.F.C.  
 Temp. Sec. Lt. A. A. N. PENTLAND, Gen. List and R.F.C.  
 Temp. Sec. Lt. L. A. POWELL, Glouc. R., attd. R.F.C.  
 Sec. Lt. C. K. SMITH, R.F.C., Spec. Res.  
 Lt. G. K. SMITH, Gen. List and R.F.C.  
 Temp. Sec. Lt. R. D. STARLEY, Gen. List and R.F.C.  
 Temp. Lt. J. A. STEVENSON, Gen. List and R.F.C.  
 Temp. Sec. Lt. R. N. TREADWELL, Gen. List and R.F.C.  
 Lt. (temp. Capt.) F. McD. C. TURNER, R.F.C., Spec. Res.  
 Temp. Lt. W. WALLACE, Gen. List and R.F.C.  
 Temp. Sec. Lt. C. W. WARMAN, Gen. List and R.F.C.  
 Sec. Lt. G. A. WELLS, R.F.C., Spec. Res.  
 Lt. (temp. Capt.) H. D. WILLIAMS, R.F.C., Spec. Res.  
 Temp. Sec. Lt. E. WILSON, Gen. List and R.F.C.  
 Temp. Lt. (temp. Capt.) H. W. WOOLETT, Gen. List and R.F.C.  
 Sec. Lt. A. C. YODALS, R.F.C.  
 CANADIAN FORCE.  
 Lt. D. L. BURGESS, Infy., attd. R.F.C.

Oct. 11th.

Lt. WILLIAM WALLACE COOK, N.Z. Forces and R.F.C. (action ag:inst an airship).

Oct. 18th.

Temp. Capt. RUPERT NORMAN GOULD ATKINSON, Gen. List and R.F.C.  
 Sec. Lt. JOHN AUGUSTE BORET, R. W. Surr. R. and R.F.C.  
 Temp. Sec. Lt. CHARLES WILLIAM CUDEMOER, Gen. List and R.F.C.  
 Sec. Lt. (temp. Lt.) JULIUS DIAMOND, K.O.S.B., Spec. Res., and R.F.C.  
 Temp. Sec. Lt. MATTHEW BROWN FREW, Gen. List and R.F.C.  
 Temp. Sec. Lt. REGINALD EDGAR GILBERT FULLJAMES, Gen. List and R.F.C.  
 Temp. Lt. HERBERT DONALD HARMAN, Gen. List and R.F.C.  
 Lt. SPENCER BERTRAM HORN, D. Gds. and R.F.C.  
 Temp. Sec. Lt. HENRY ALBERT JONES, attd. Wilts R. and R.F.C.  
 Capt. GERALD JOSEPH CONSTABLE MAXWELL, Yeo. and R.F.C.  
 Temp. Sec. Lt. KEITH KNOX MUSPRATT, Gen. List and R.F.C.  
 Sec. Lt. ALAN CHRISTOPHER TEMPLE PERKINS, R.G.A., Spec. Res., and R.F.C.  
 Temp. Sec. Lt. WALTER MAURICE PIERCE, Gen. List and R.F.C.  
 Temp. Sec. Lt. (temp. Capt.) W. J. TEMPEST, D.S.O., Gen. List and R.F.C.  
 Sec. Lt. (temp. Lt.) F. W. H. THOMAS, Yeo. and R.F.C.  
 Capt. C. T. VACHELL, Mon. R. and R.F.C.  
 Sec. Lt. (temp. Lt.) L. WALMSLEY, E. York. R., Spec. Res., and R.F.C.  
 Temp. Lt. OLIVER BYERLEY WALTER WILLS, R.F.C.  
 Sec. Lt. FREDERICK WOODCOCK, R.G.A., Spec. Res. and R.F.C.

Oct. 27th.

Temp. Sec. Lt. R. H. AYRE, Gen. List and R.F.C.  
 Sec. Lt. (temp. Capt.) C. A. BREWSTER-YOSKE, Gen. List and R.F.C.  
 Sec. Lt. (temp. Lt.) J. H. BROADWAY, Dorset R., Spec. Res., attd. R.F.C.  
 Temp. Sec. Lt. G. W. FERGUSON, Gen. List and R.F.C.  
 Sec. Lt. (temp. Capt.) A. GRAY, Arg. and Suthd. Highrs. and R.F.C.  
 Temp. Sec. Lt. R. F. HILL, Gen. List and R.F.C.  
 Sec. Lt. C. F. HORSLEY, Norf. R. and R.F.C.  
 Temp. Capt. J. LEACROFT, Gen. List and R.F.C.  
 Temp. Lt. H. G. E. LUCHFORD, Gen. List and R.F.C.  
 Sec. Lt. (temp. Lt.) F. L. MCCREARY, S. Lan. R. and R.F.C.  
 Temp. Lt. T. T. S. MENENDEZ, Gen. List and R.F.C.  
 Lt. (temp. Capt.) M. D. G. SCOTT, N. Lanc. R., Spec. Res., and R.F.C.  
 Capt. W. SMITH, Lon. R. and R.F.C.  
 Sec. Lt. C. A. STEVENS, W. Rid. R. and R.F.C.  
 Sec. Lt. R. WINNICOTT, Vidon. R. and R.F.C.

CANADIAN FORCE.

Lt. A. G. GOULDING, Infy. and R.F.C.

Nov. 19th.

Sec. Lt. (temp. Capt.) G. L. LLOYD, Yeo. and R.F.C.

CANADIAN FORCE.

Lt. W. B. FERGUSON, Can. Rail. Troops and R.F.C.

Nov. 26th.

Lt. (temp. Capt.) D. S. HALL, Arg. and Suthd. Highrs. and R.F.C.

Capt. F. H. LAURENCE, Worc. R., Spec. Res., and R.F.C.

Temp. Lt. J. S. MICHIE, Gen. List and R.F.C.

Sec. Lt. J. D. PAINE, Gen. List and R.F.C.

Sec. Lt. (temp. Capt.) F. SOWREY, D.S.O., R. Fus. and R.F.C.

Dec. 17th.

Lt. (temp. Capt.) J. M. BURD, R.F.A. and R.F.C.

Lt. E. W. CLARKE, R.F.C., Spec. Res.

Temp. Sec. Lt. W. DURRAND, Gen. List and R.F.C.

Temp. Capt. H. O. W. HILL, R.F.C.

Sec. Lt. D'A. F. HILTON, R.F.C., Spec. Res.

Sec. Lt. H. H. MADDOCKS, Gen. List and R.F.C.

Capt. J. J. L. WILLIAMS, Yeo., attd. R.F.C. (Egypt)

Dec. 18th.

FOR ANTI-AIRCRAFT SERVICES.

Sec. Lt. F. A. D. GRACE, S.R., R.F.C.

Temp. Sec. Lt. G. MURRAY, Gen. List, R.F.C.

Temp. Sec. Lt. T. B. PRITCHARD, late Gen. List and R.F.C.

Jan. 1st, 1918.

Lt. (temp. Maj.) JAMES ROBERT FEDWELL, R.G.A. and R.F.C.

Temp. Sec. Lt. JOHN BENNETT, R.F.C.

Temp. Lt. ARTHUR FREDERICK BRITTON, Gen. List and R.F.C.

Capt. EDRIC WILLIAM BROADBERRY, Essex R. and R.F.C.

Temp. Capt. CARLETON MAIN CLEMENT, Gen. List and R.F.C.

Temp. Capt. JAMES FREDERICK DAVISON, Gen. List and R.F.C.

Sec. Lt. (temp. Capt.) OLIVER HARRY FROST, Middx. R. and R.F.C.

Lt. (temp. Capt.) GEORGE DUDLEY GARDNER, York. R. and R.F.C.

Sec. Lt. (temp. Lt.) JOHN MCGOWAN GLEN, R. Scots, attd. R.F.C.

Capt. (temp. Maj. in Army) KELHAM KIRK HORN, R.F.C., Spec. Res.

Temp. Sec. Lt. (temp. Capt.) WILLIAM SHERRIN HUXLEY, Gen. List, attd. R.F.C.



We are makers of  
**Hinge Pins**  
to drawing

**7948/1-2-3**

at  $\frac{3}{6}$  the set of three.

*Orders only accepted from firms actually engaged in the manufacture of aeroplanes.*

**COVENTRY AVIATION COY.**

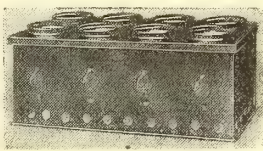
34a, EARL STREET, COVENTRY.

Phone: 92 Coventry.

Wires: Coviation, Coventry.

**GLUE POTS** (any shape or size).

GENERAL  
SHEET  
METAL  
WORK.



PETROL  
TANKS,  
Etc.,

OXY-ACETYLENE WELDING.

**ARTHUR HILL & CO.,**

SILCHESTER ROAD,

LONDON, W.10.

'Phone—PARK 1445.

**Where Flying Men are fitted out.**



**For Fight and Flight.**

A man flies—and fights—at his best when fitly clad for the work. Many an air man would say "when Dunhill-clad," acclaiming Dunhills' leadership in the new outfitting science of kit-making for flying men.

Who better—who indeed so well—qualified to pioneer, to blaze the trail, as the house whose fame as motoring outfitters is old as motoring itself, armed as that house must be with the knowledge and skill so accumulated, equipped with the fullest resources

Here you have the simple reason why Dunhills are always a step further than the furthest of its rivals—and flying men play for stakes far too high to ignore the significance of that fact.

**LEATHER COMBINATION SUIT,**

lined soft, snug camel fleece.

	to knee.	to ankle.
Tan Leather ...	9 gns.	10 gns.
Black " ...	10 "	11 "

WRITE FOR A CATALOGUE.

**Dunhill's**  
LIMITED,

2, Conduit Street, London, W.1.

MANCHESTER:  
90 and 92, Farnworth Street.

GLASGOW:  
72, St Vincent Street.

**THE  
BRITISH WRIGHT  
CO. LTD.**

Owners of the British, Italian and Belgian Patents of Wilbur and Orville Wright.

Manufacturers of  
**AERONAUTICAL  
INSTRUMENTS**

FOR

NAVY & ARMY AEROPLANES

Ogilvie Air Speed Indicators

for use on Aeroplanes, Airships, Kites, Balloons and Air Stations.

Statoscopes.

Recording Manometers.

Wind Speed Recorders.

At present the Government is taking the entire output, but British and Foreign firms are invited to place their orders now for delivery of Aeronautical Instruments after the War.

**The BRITISH WRIGHT Co Ltd.**

33, CHANCERY LANE, LONDON, W.C.2.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

## THE HONOURS LIST OF R.F.C. IN 1917.

## The Military Cross (continued).

Sec. Lt. (temp. Lt.) JOHN WALTER DICKINSON LEIGH, Cyc. Bn. and R.F.C.

Jan. 1st, 1918.

Lt. (temp. Capt.) JAMES YOUNGER MCLEAN, R.F.A. and R.F.C.  
Lt. (temp. Capt.) CHARLES STEWART MORICE, Worc. R. and R.F.C.

Temp. Sec. Lt. (temp. Lt.) GEORGE SCOTT MURRAY, Gen. List and R.F.C.

Temp. Capt. ARTHUR ROBERT PENNY, Gen. List and R.F.C.

Capt. OVERTON INETT PRESTON, Notts. and Derby R. and R.F.C.

Capt. HECTOR MURDOCH MAXWELL ROBERTSON, R.A., attd. R.F.C.

Capt. (temp. Lt.-Col.) THOMAS FOSTER RUTLEDGE, R.F.C., Spec. Res.

Temp. Sec. Lt. HERBERT JAMES SCALES, Gen. List and R.F.C.

Lt. (temp. Capt.) WILLIAM ERIC LEWIS SEWARD, R.F.C., Spec. Res.

Temp. Lt. (temp. Capt.) STEPHEN BERTHOLD SMITH, R.F.C.

Sec. Lt. (temp. Maj.) LEONARD ARTHUR TILNEY, R.H. Gds. and R.F.C.

Capt. CYRIL WALTER CARLETON WASEY, R. War. R., attd. R.F.C.

Sec. Lt. PERCY HENRY ROY WHITTET, R.F.C., Spec. Res.

Lt. (temp. Capt.) CUTHBERT WALTER WISE, A.S.C., Spec. Res. and R.F.C.

Temp. Lt. ROBERT MAINWARING WYNNE-EYTON, Gen. List and R.F.C.

## CANADIAN FORCE.

Lt. WILLIAM KENNEDY ANDERSON, Inf. and R.F.C.

## A Bar to the Military Cross.

Sec. Lt. (temp. Lt.) ALAN DUNCAN BELL-IRVING, M.C., Gord. Highrs., Spec. Res., and R.F.C.

Sec. Lt. HAMILTON ELLIOT HERVEY, M.C., Gen. List and R.F.C.

Capt. JOHN WHITAKER WOODHOUSE, M.C., R.F.C. (S.R.).

Sec. Lt. (temp. Lt.) GILBERT WARE MURLIS GREEN, M.C., Gen. List and R.F.C.

Lt. (temp. Capt.) JOHN WHITAKER WOODHOUSE, M.C., R.F.C., Spec. Res.

Lt. (temp. Capt.) WALTER DALRYMPLE MAITLAND BELL, M.C., R.F.C., Spec. Res.

Temp. Lt. (temp. Capt.) WILLIAM GEORGE SELLAR CURPHEY, M.C., Gen. List and R.F.C.

Capt. ROBERT ONSPRING, M.C., York L.I., Spec. Res., and R.F.C.

Lt. (temp. Capt.) P. C. SHERRËN, M.C., Can. Local Forces and R.F.C.

Temp. Sec. Lt. CHARLES THORNTON CLEAVER, M.C., Gen. List, and R.F.C.

Temp. Sec. Lt. WILLIAM GEORGE BARKER, M.C., Gen. List and R.F.C.

Capt. FRANCIS RICHARD CUBBON, M.C., Ind. A., attd. R.F.C.

Lt. (temp. Capt.) FREDERICK JAMES HARRY THAYRE, M.C., R.F.C., Spec. Res.

Lt. (temp. Capt.) WILLIAM VICTOR STRUGNELL, M.C., Hamps. R. and R.F.C.

Temp. Lt. WILLIAM ARTHUR BOND, M.C., Yorks L.I. and R.F.C.

Sec. Lt. WILLIAM CHARLES CAMPBELL, M.C., R.F.C., Spec. Res.

Lt. (temp. Capt.) WILLIAM JOHN CHARLES KENNEDY-COCHRAN-PATRICK, M.C., Rif. Bde. and R.F.C.

Temp. Capt. ANTHONY HERBERT WILLIAM WALL, M.C., Middx. R. and R.F.C.

Temp. Lt. LOUIS FLEEMING JENKIN, M.C., Gen. List and R.F.C.

Sec. Lt. (temp. Capt.) ARTHUR GORDON JONES-WILLIAMS, M.C., Welsh R., attd. R.F.C.

Sec. Lt. ARTHUR PERCIVAL FOLEY RHYS-DAVIDS, M.C., R.F.C., Spec. Res.

Lt. (temp. Capt.) S. H. CLARKE, M.C., Wilts R., Spec. Res. and R.F.C. (M.C. gazetted Nov. 14th, 1916).

Temp. Capt. P. F. FULLARD, M.C., Gen. List and R.F.C. (M.C. gazetted in this "Gazette").

Temp. Capt. N. W. WEBB, M.C., Gen. List and R.F.C. (M.C. gazetted Jan. 1st).

Sec. Lt. W. B. WOOD, M.C., Hamps. R. and R.F.C. (M.C. gazetted Sept. 17th).

Oct. 18th.

Sec. Lt. LEONARD MONTEAGLE BARLOW, M.C., R.F.A., Spec. Res., attd. R.F.C. (M.C. gazetted Aug. 25th, 1917).

Lt. (temp. Capt.) CLIVE FRANKLYN COLLETT, M.C., R.F.C., Spec. Res., and Gen. List (M.C. gazetted Sept. 26th, 1917).

Temp. Capt. PHILIP JAMES VAUGHAN LAVARACK, M.C., Gen. List and R.F.C. (M.C. gazetted May 25th, 1917).

Temp. Sec. Lt. (temp. Capt.) EDWARD MANNOCK, M.C., R.E. and R.F.C. (M.C. gazetted Sept. 17th, 1917).

Sec. Lt. (temp. Capt.) DONALD FASKEN STEVENSON, Yeo. and R.F.C. (M.C. gazetted Sept. 17th, 1917).

Oct. 27th.

Sec. Lt. R. B. ASHCROFT, M.C., Notts and Derby R., Spec. Res. and R.F.C. (M.C. gazetted Sept. 26th, 1917).

Lt. (temp. Capt.) G. H. BOWMAN, M.C., R. War. R., Spec. Res. and R.F.C. (M.C. gazetted Sept. 17th, 1917).

Sec. Lt. (temp. Lt.) R. T. C. HOIDGE, M.C., R.G.A., Spec. Res. and R.F.C. (M.C. gazetted July 18th, 1917).

Sec. Lt. (temp. Capt.) J. T. B. MCCUDDEN, M.C., Gen. List and R.F.C. (M.C. gazetted March 12th, 1917).

Lt. A. E. MCKEEVER, M.C., R.F.C., Spec. Res. (M.C. gazetted Sept. 17th, 1917).

Sec. Lt. K. R. PARK, M.C., R.F.A., R.F.C. (M.C. gazetted Sept. 26th, 1917).

Lt. (actg. Capt.) S. R. C. PLIMSOLL, M.C., R.F.A. (M.C. gazetted March 3rd, 1917).

Temp. Lt. (actg. Capt.) H. A. REDDING, M.C., Suff. R. (M.C. gazetted Nov. 14th, 1916).

Sec. Lt. W. H. RICHARDSON, M.C., Lond. R. (M.C. gazetted Aug. 25th, 1917).

Sec. Lt. A. C. YODALE, M.C., R.F.C., Spec. Res. (M.C. gazetted Sept. 26th, 1917).

Nov. 26th.

Temp. Capt. H. G. E. LUCHFORD, M.C., Gen. List and R.F.C. (M.C. gazetted Oct. 27th).

Sec. Lt. (temp. Lt.) V. R. S. WHITE, M.C., S. Staffs. R., Spec. Res. and R.F.C. (M.C. gazetted May 26th).

Dec. 17th.

## FOR ANTI-AIRCRAFT SERVICES.

Temp. Sec. Lt. M. B. FREW, M.C., Gen. List and R.F.C. (M.C. gazetted Oct. 18th, 1917).

Lt. R. A. MAYBERY, M.C., Lrs. and R.F.C. (M.C. gazetted Sept. 26th, 1917).

Sec. Lt. L. A. POWELL, M.C., Gen. List and R.F.C. (M.C. gazetted Sept. 26th, 1917).

Jan. 1st, 1918.

Capt. GERALD WILLIAM HODGKINSON, M.C., Yeo. and R.F.C.  
Capt. WALTER SOMERVILLE SCOTT, M.C., Lanc. Fus., attd. R.F.C.

## A Second Bar to the Military Cross.

Oct. 27th.

Lt. L. M. BARLOW, M.C., R.F.C., Spec. Res. (M.C. gazetted Aug. 25th, 1917) (1st Bar gazetted Oct. 16th, 1917).

Jan. 7th, 1918.

## FOR ANTI-AIRCRAFT SERVICES.

Lt. (temp. Capt.) GILBERT WARE MURLIS GREEN, D.S.O., M.C., Gen. List and R.F.C.

## THE DISTINGUISHED CONDUCT MEDAL.

Feb. 1st.

Z179 Serjt. A. J. Horne, R.F.C.; Z150 Cpl. S. F. Marucchi, R.F.C.; Z8 Cpl. C. J. Thomson, R.F.C.; Z31 Flt. Serjt. T. Turnbull, R.F.C.

March 26th.

23921 Serjt. H. G. Smith, R.F.C.

April 26th.

6391 Cpl. (actg. Serjt.) F. Johnson, R.F.C.

May 12th.

3516 Serjt. G. J. Mackie, R.F.C.; 35972 Serjt. J. F. Ridgway, R.F.C.

May 26th.

Z185 Flt. Serjt. D. Grant, R.F.C.; Z181 Serjt.-Maj. J. E. Pearson, R.F.C.

June 2nd.

1660 Flt. Serjt. G. Greenfield, R.F.C.; 279 Flt. Serjt. (actg. Serjt.-Maj.) C. E. King, R.F.C.; 1908 Cpl. E. Langridge, R.F.C.; Serjt. T. J. Mountford, R.F.C.; 6729 1st Cl. Air Mech. E. Rogers, R.F.C.

June 18th.

24107 Flt. Serjt. G. G. L. Blake, R.F.C.; 65935 2nd Cl. Air Mech. L. H. Emsden, R.F.C.

July 26th.

8202 Sec. Cl. Air Mech. R. C. Cooper, R.F.C.

Aug. 17th.

22025 Serjt. R. O. Campbell, R.F.C.; 54267 Serjt. C. R. L. Falcay, R.F.C.; 53352 2nd Air Mech. J. H. Holdershaw, R.F.C., attd. R.G.A.



Telephone : STRATFORD 973.

Telegrams : "AEROMEECOL, PHONE, LONDON."

CONTRACTORS TO THE AIR BOARD,

**MEEERLOO****ENGINEERING COMPANY, LTD**

MANAGING DIRECTOR: JOHN MEEERLOO, JUNR.

PRODUCING BOTH BY DAY AND NIGHT

**|| A.G.S. PARTS. ||****HEX. NUTS.**

A.G.S. Nos.  
 115 B 2 BA.  
 115 C 4 BA.  
 115 D 6 BA.

**PINS**

(100 Ton)  
 A.G.S. No. 383  
 In All Sizes from  
 Part No. 1 to 208.

**UNIVERSAL  
FORK JOINTS**

A G.S. Nos, 333,  
 334, 335, 336.

**TRUNNIONS  
AND  
LOCK NUTS**

A.G.S. Nos. 333, 334,  
 335, 336, 337, 338, 339,  
 340 and 341.

THE MOST MODERN PLANT IN LONDON.

EASTERN WORKS, FOREST LANE, STRATFORD, LONDON, E. 15

OPPOSITE MARYLAND POINT STATION, G. E. RLY.

**STANLEY  
PROPELLERS**

BY

THE  
**STANLEY  
 AVIATION  
 CO.**  
 67 KINGSLAND RD  
 LONDON  
 E.2  
 GOVERNMENT  
 CONTRACTORS.  
 TEL: CITY 8347

E. COFFIN.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

## THE HONOURS LIST OF R.F.C. IN 1917.

## The Distinguished Conduct Medal (continued).

- Aug. 25th.  
7420 1st Cl. Air Mech. C. M. Reynolds, R.F.C.
- Oct. 22nd.  
77690 1st Cl. Air Mech. A. W. Cant, R.F.C. (Uppingham);  
4965 1st Cl. Air Mech. S. Hall, R.F.C. (Newton Heath, Manchester); 3116 Serjt. W. E. Smith, R.F.C. (Barnes Park, London); 48027 Pnr. W. T. Smith, R.E., attd. R.F.C. (Kensal Rise, London); 4400 Serjt. R. C. Taylor, R.F.C. (Willesden).
- Nov. 19th.  
2105 Serjt. S. T. Clinch, R.F.C. (E. Ham, London, E.);  
94311 2nd Cl. Air Mech. W. Walker, R.F.C. (Hull).
- Dec. 12th.  
445 Flt. Serjt. H. Campbell, R.F.C. (Auckland, N. Zealand).
- Jan. 1st.  
11559 Corpl. C. J. French, R.F.C. (Watford).  
49181 Serjt. A. R. Hervey-Bathurst, R.F.C. (London, W.).

## THE MILITARY MEDAL.

- Jan. 6th.  
6640 1st Cl. Air Mech. H. Alexander, R.F.C.
- Jan. 22nd.  
820 Flt. Sjt. A. Hamilton, R.F.C.; 2073 1st Cl. Air Mech. O. F. Watts, late R.F.C.
- Feb. 19th.  
856 Flt. Serjt. G. W. Halstead, R.F.C.
- March 12th.  
8575 1st Cl. Air Mech. A. Balfour, R.F.C.; 15632 1st Cl. Air Mech. W. E. Perkins, R.F.C.; 24981 Cpl. W. J. Perrott, R.F.C.; 1145 Flt. Serjt. F. N. Sungsbj, R.F.C.; 18030 2nd Cl. Air Mech. H. T. Taylor, R.F.C.
- March 26th.  
320 L.-Cpl. R. A. Cartledge, R.F.C.
- April 17th.  
Po. 578 (S.) Pte. J. Collinson, R.M.L.I., attd. R.F.C.
- April 26th.  
9272 2nd Cl. Air Mech. J. H. Beaven, R.F.C.; 7770 1st Cl. Air Mech. F. T. Fowler, R.F.C.; 50863 2nd Cl. Air Mech. A. E. Rudd, R.F.C.
- May 12th.  
28941 2nd Cl. Air Mech. F. Bond, R.F.C.; 8124 1st Cl. Air Mech. H. Boulton, R.F.C.; 32925 1st Cl. Air Mech. P. Craig, R.F.C.; 17942 2nd Cl. Air Mech. J. Dunn, R.F.C.; 25674 2nd Cl. Air Mech. W. Knight, R.F.C.; 61869 2nd Cl. Air Mech. E. Wood, R.F.C.
- May 26th.  
10708 Pte. T. E. Allum, E. Surr. R., attd. R.F.C.
- July 9th.  
77449 Serjt. B. Aldred, R.F.C.; 5303 Cpl. E. Harper, R.F.C.; 9236 1st Cl. Air Mech. H. J. Hayes, R.F.C.; 4251 1st Cl. Air Mech. N. Parkinson, R.F.C.; 12270 1st Cl. Air Mech. J. Thompson, R.F.C.; 1197 Cpl. R. E. Tollerfield, R.F.C.
- July 18th.  
12867 2nd Cl. Air Mech. A. J. Acock, R.F.C.; 6509 1st Cl. Air Mech. G. A. Beardmore, R.F.C.; 44359 2nd Cl. Air Mech. F. C. King, R.F.C.; 50120 2nd Cl. Air Mech. H. Potter, R.F.C.; 9566 Cpl. F. H. Squire, R.F.C.; 13554 1st Cl. Air Mech. R. H. Thomas, R.F.C.; 3075 1st Cl. Air Mech. J. D. Wynne, R.F.C., attd. R.F.A.
- July 28th.  
6705 1st Cl. Air Mech. T. Reynolds, R.F.C.
- Aug. 6th.  
566 Serjt. Sydney Ashby, R.F.C. (in connection with the destruction of an enemy airship).
- Aug. 16th.  
13990 1st Cl. Air Mech. C. F. Nesbitt, R.F.C.; 65519 2nd Cl. Air Mech. W. H. Poole, R.F.C.; 8853 2nd Cl. Air Mech. L. Spicer, R.F.C.
- Aug. 21st.  
13230 1st Cl. Air Mech. G. W. Nelson, R.F.C.; 9176 1st Air Mech. M. V. Pocock, R.F.C.; 65088 Serjt. F. Reeday, R.F.C.; 79004 Cpl. F. Woodward, R.F.C.
- Sept. 17th.  
6642 1st Cl. Air Mech. F. J. W. Adams, R.F.C. (Blackheath, S.E.); 7773 1st Cl. Air Mech. H. R. Deane, R.F.C. (Marylebone); 64246 1st Cl. Air Mech. H. V. Rowlatt, R.F.C. (Peterborough).
- Sept. 28th.  
869 O.M.-Serjt. W. W. Clark, R.F.C. (Wanstead); 2866 Serjt. L. A. Herbert, R.F.C. (Richmond); 1st Cl. Air Mech. P. F. Hooker, R.F.C. (Maidstone); 182 1st Cl. Air Mech. C. E. Hyde, R.F.C. (Malton); 393 Cpl. J. P. Powell, R.F.C. (Market Drayton); 2797 Cpl. L. Van Schaick, R.F.C. (St. Helens).
- Oct. 18th.  
7443 1st Cl. Air Mech. F. A. Biscoe, R.F.C. (East Sheen); 47936 2nd Cl. Air Mech. W. Hewitt, R.F.C. (S. Gasforth); 50104 2nd Cl. Air Mech. J. Thomas, R.F.C. (Pantylates).
- Nov. 3rd.  
7546 1st Cl. Air Mech. P. E. Gudgeon, R.F.C. (Derby);

- 8361 1st Cl. Air Mech. W. G. Hodges, R.F.C. (Glastonbury);  
33549 1st Cl. Air Mech. J. A. Newell, R.F.C. (Halifax).

- Nov. 19th.  
44750 2nd Cl. Air Mech. A. Cohen, R.F.C., attd. R.G.A. (Houndsditch, E.C.); 78140 Serjt. A. F. Fraser, R.F.C. (Gravesend); 8601 1st Cl. Air Mech. H. J. Lee, R.F.C., attd. R.G.A. (Wands-worth, S.W.); 10220 1st Cl. Air Mech. W. E. Lister, R.F.C., attd. R.G.A. (Blackpool); P/13911 Cpl. J. Mason, R.F.C. (Everton); 23232 Serjt. A. A. L. C. Moir, R.F.C. (Kenley); 43972 2nd Cl. Air Mech. W. V. D. Street, R.F.C., attd. R.F.A. (Eastbourne); 65385 1st Cl. Air Mech. H. Watson, R.F.C. (Thornton).

- Dec. 12th.  
958 Serjt. G. W. Eddington, R.F.C. (Tottenham); 8857 1st Cl. Air Mech. C. W. Cosgrove, R.F.C. (New Southgate); 49338 2nd Cl. Air Mech. T. H. Lea, R.F.C. (Wilmslow); 94425 2nd Cl. Air Mech. S. L. Leyland, R.F.C. (Wallasey); 94039 2nd Cl. Air Mech. S. Moreman, R.F.C., late Som. L.I. (Plymouth); 87808 Cpl. T. Triese, R.F.C. (Heywood); 94042 2nd Cl. Air Mech. (Actg. Cpl.) A. Walters, R.F.C. ([E.] Birmingham).

- Dec. 17th.  
88288 Serjt. W. J. Bengier, R.F.C. (Ewell); 45211 1st Cl. Air Mech. C. S. Britten, R.F.C., attd. R.G.A. (Brondesbury, N.W.); 10500 1st Cl. Air Mech. W. Morgan, R.F.C. (Treharris, Glam.); 78563 1st Cl. Air Mech. A. G. J. Whitehouse, R.F.C. (Northampton).

- Dec. 18th.  
FOR ANTI-AIRCRAFT SERVICES.  
No. 564555 Snp. R. E. Fraser, R.E.; No. 23555 Ftr. J. Horner, R.G.A.

## THE MERITORIOUS SERVICE MEDAL.

- Jan. 24th.  
24266 1st Cl. Air Mech. E. E. Childs, R.F.C.; 20943 1st Cl. Air Mech. T. P. Watson, R.F.C.

- Feb. 2nd.  
3270 Serjt. J. W. Todd, R.F.C.
- March 12th.  
1874 Cpl. G. Dunn, R.F.C.; 3450 Flt. Serjt. L. Frier, R.F.C.; 106 Flt. Serjt. G. J. Langfield, R.F.C.; 63 Flt. Serjt. A. E. Lewis, R.F.C.; 11181 Cpl. R. R. Turner, R.F.C.

- June 2nd.  
16796 Flt. Serjt. W. Anderson, R.F.C.; 266 Flt. Serjt. (Actg. Serjt.-Maj.) J. A. Aspinall, R.F.C.; 6682 Cpl. T. A. Bates, R.F.C.; 1087 Flt. Serjt. (actg. Serjt.-Maj.) C. W. Brown, R.F.C.; 950 Actg. Serjt.-Maj. C. E. H. Bunting, R.F.C.; 291 Serjt. (actg. Serjt.-Maj.) J. F. Clarke, R.F.C.; 2131 Flt. Serjt. H. Cooper, R.F.C.; 1576 Serjt. G. H. Hall, R.F.C.; 89825 Serjt. (actg. Serjt.-Maj.) R. W. Harrison, R.F.C.; 1374 Flt. Serjt. G. Jappe, R.F.C.; 4254 Flt. Serjt. J. W. Kellett, R.F.C.; 10942 Flt. Serjt. E. A. Lane, R.F.C.; 59 Flt. Serjt. J. Longhurst, R.F.C.; 6262 Cpl. T. H. Moore, R.F.C.; 1085 Flt. Serjt. (actg. Serjt.-Maj.) M. O'Connor, R.F.C.; 4234 Flt. Serjt. H. Peters, R.F.C.; 26950 Serjt. H. H. Ridley, R.F.C.; 5444 Flt. Serjt. W. Thomason, R.F.C.; 2507 Flt. Serjt. C. Trevett, R.F.C.

- June 18th.  
2197 Flt. Serjt. F. Batty, R.F.C.
- Aug. 16th.  
5046 Serjt. E. C. Chapman, R.F.C.; 1676 Flt. Serjt. W. A. H. Coates, R.F.C.; 213 Temp. Serjt.-Maj. C. T. Davies, R.F.C.; 77481 Serjt. H. Deacon, R.F.C.; 120 Actg. Serjt.-Maj. W. Sharp, R.F.C.; 1651 Flt. Serjt. A. Vaile, R.F.C.

- Aug. 21st.  
AUSTRALIAN IMPERIAL FORCE.  
532 2nd Cpl. (Air Mech.) T. J. Carmody, A.F.C.; 666 Serjt. A. G. Dalzell, A.F.C.; 630 1st Cl. Air Mech. C. M. T. Lee, A.F.C.; 684 1st Cl. Air Mech. V. Smith, A.F.C.

- Aug. 29th.  
1859 Cpl. R. Colwill, R.F.C.; 8268 1st Cl. Air Mech. J. F. Wilder, R.F.C.; 2567 Serjt. H. H. Wright, R.F.C.; 78169 Cpl. P. Phillips, R.F.C.

- Nov. 19th.  
69380 2nd Cl. Air Mech. A. H. Norris, R.F.C. (Wood Green).

- Dec. 17th.  
2546 Serjt. W. F. Parke, R.F.C. (Gt. Leigh); 1655 Serjt. (A./Flt. Serjt.) F. F. W. Darke, R.F.C. (Guildford); 7677 Flt. Serjt. (T./S./M.) L. R. Fears, R.F.C. (Kennington, S.E.); 1267 Serjt. R. J. H. Holland, R.F.C. (Branksome); 4384 Serjt. G. E. J. Horwood, R.F.C. (Camden); 12128 Serjt. (A./Flt. Serjt.) J. W. Large, R.F.C. (Peckham, S.E.); 2021 Serjt. A. Leslie, R.F.C. (Bucksburn, N.B.); 3306 Serjt. (A./Flt. Serjt.) H. H. Medham, R.F.C. (Nechells); 5775 S./M. H. W. Prickett, R.F.C. (Small Heath); 662 Flt. Serjt. W. Simpson, R.F.C. (Sunderland); 11778 Flt. Serjt. W. Swinburn, R.F.C. (Sheffield).

- AUSTRALIAN IMPERIAL FORCE.  
A/296 Serjt. L. Horscroft, Aust. F.C.; A/332 Flt. Serjt. H. Johnston, Aust. F.C.; A/105 Flt. Serjt. R. S. Robertson, Aust. F.C.



## THE HONOURS LIST OF R.F.C. IN 1917.

## The Meritorious Service Medal (continued)

Jan. 1st, 1918.

11798 Serjt. G. A. Booker, R.F.C. (Wembley).  
 13752 Flt. Serjt. G. E. Chrigwin, R.F.C. (Streatham).  
 3472 Serjt. (A./S./M.) A. J. Cook, R.F.C. (Newcastle-on-Tyne).  
 032 Serjt. (A./S./M.) T. Cummins, R.F.C. (Bristol).  
 1463 Serjt. (A./S./M.) J. A. Cundy, R.F.C. (St. John's Wood).  
 10530 Flt. Serjt. F. W. Dodd, R.F.C. (Dalston).  
 5182 Flt. Serjt. W. Harvey, R.F.C. (Wheathampstead).  
 1647 Flt. Serjt. W. H. Hellon, R.F.C. (Dover).  
 6281 Corpl. T. J. Keane, R.F.C. (Aberystwyth).  
 19497 Corpl. (A./Serjt.) E. W. King, R.F.C. (Harringay).  
 11000 Serjt. E. Laughton, R.F.C. (Conisbro').  
 18014 Serjt. W. S. Leigh, R.F.C. (Brighton).  
 4682 Flt. Serjt. C. Lyne, R.F.C. (Chichester).  
 3862 Flt. Serjt. C. R. Orchard, R.F.C. (Croydon).  
 22548 Flt. Serjt. F. Ramsay, R.F.C. (Snaith).  
 1561 Serjt. (T.S./M.) J. Wainwright, R.F.C. (Caledonian Road, N.).  
 347 Serjt. (T.S./M.) A. Webb, R.F.C. (Finsbury Park, N.).  
 13802 Flt. Serjt. T. O. Webber, R.F.C. (Hawkhurst).  
 5084 1st Cl. A./M. J. G. Weldon, R.F.C. (Sefton Park).  
 5949 Flt. Serjt. E. E. White, R.F.C. (Camberley).  
 4996 Serjt. (T.S./M.) W. G. Willis, R.F.C. (Bristol).

## THE ALBERT MEDAL.

The King has been pleased to award the Decoration of the Albert Medal to the undermentioned Officer and Non-Com. Officer of his Majesty's Forces serving in France or elsewhere in recognition of their gallantry in saving life:—

Lt. F. S. SMITH and Serjt. W. E. RHOADES, both of the R.F.C.

At an aerodrome in France, on October 14th, 1916, a bomb accidentally exploded in the mouth of a dug-out forming a bomb store, which contained a large number of bombs packed in wooden cases and a quantity of rockets. Two men were killed by the explosion, and another man, who was severely injured, was thrown down into the store. Dense volumes of smoke issued from the dug-out, and there was great risk of a further explosion. Lt. (then Sec. Lt.) Smith, on hearing a call for help, immediately entered the dug-out, followed by Serjt. Rhoades, and succeeded in rescuing the wounded man, who would otherwise have been suffocated.

## FOREIGN DECORATIONS.

## CONFERRED BY THE PRESIDENT OF THE FRENCH REPUBLIC.

Feb. 14th, 1917.

To date from Nov. 9th, 1916.

## LEGION D'HONNEUR.

CROIX DE COMMANDEUR.—Major and Brevet Col. (temp. Maj.-Gen.) Hugh Montague Trenchard, C.B., D.S.O., A.D.C., R. Scots Fus.

March 9th.

## CROIX DE GUERRE.

Sec. Lt. Horace Martin Capon Ledger, I. A. Res., attd. French Seaplane Squadron, Oct. 28th, 1915.  
 208 Serjt.-Maj. Albert Hunter, R.F.C. (now Sec. Lt., W. Riding R., attd. R.F.C.), Feb. 8th, 1917.

May 1st.

## CROIX DE GUERRE.

Temp. Sec. Lt. J. L. Bamford, Gen. List, attd. R.F.C.  
 Lt. (temp. Capt.) A. D. Bell-Irving, M.C., Gord. Highrs., Spec. Res. and R.F.C.  
 Sec. Lt. V. W. B. Castle, R.F.C., Spec. Res.  
 Lt. (temp. Capt.) J. A. G. De Courcy, M.C., R.A. and R.F.C.  
 Temp. Sec. Lt. R. V. Franklin, Gen. List and R.F.C.  
 Sec. Lt. (temp. Capt.) J. W. Gordon, R.F.C., Spec. Res.  
 Temp. Sec. Lt. C. H. Marchant, Spec. List and R.F.C.  
 Sec. Lt. (temp. Capt.) R. J. Mounsey, Hamps. R. and R.F.C.  
 Temp. Sec. Lt. H. L. Pateman, Spec. List and R.F.C.  
 Temp. Lt. (temp. Capt.) J. B. Quested, A.S.C. and R.F.C.  
 1983 Serjt. A. Armstrong, R.F.C.  
 7216 Serjt. C. J. Butler, R.F.C.  
 896 Serjt. E. J. Farley, R.F.C.  
 23897 Serjt. E. Handley, R.F.C.  
 635 Serjt. P. M. Veitch, R.F.C.

## MEDAILLE MILITAIRE.

207 Actg. Serjt.-Maj. (now Sec. Lt.) J. P. Angell, R.F.C.  
 10060 Serjt. L. S. Court, R.F.C.  
 5223 Serjt. G. R. Horrocks, R.F.C.  
 5954 1st Cl. Air Mech. (now Temp. Sec. Lt.) J. L. Miles, R.F.C.  
 8193 1st Cl. Air Mech. W. E. Lowrie, R.F.C.  
 6671 1st Cl. Air Mech. C. R. Tweeddale, R.F.C.

May 21st.

## CROIX DE GUERRE.

Capt. R. H. Freeman, M.C., Wor. R., Spec. Res., and R.F.C.  
 156 Flt. Serjt. E. A. Gibbs, R.F.C.

## MEDAILLE MILITAIRE.

1726 Flt. Serjt. D. P. Calder.

June 1st.

## LEGION D'HONNEUR.

## CROIX DE CHEVALIER.

Lt. (temp. Capt.) A. Ball, D.S.O., M.C., Notts and Derby R. and R.F.C.  
 Capt. the Hon. M. Baring, R.F.C., Spec. Res.  
 Sqdn. Comdr. G. R. Bromet, D.S.O., R.N.A.S. (For Service with R.F.C.)  
 Capt. (temp. Lt.-Col.) R. C. Donaldson-Hudson, D.S.O., T.F. Res., and R.F.C.  
 Temp. Maj. A. C. B. Geddes, M.C., R.F.C.

## CROIX DE GUERRE.

Temp. Lt. (temp. Capt.) G. W. M. Green, M.C., R.F.C.  
 Temp. Capt. F. M. Hicks, R.F.C.  
 Sec. Lt. R. E. Buckingham, R.F.C., Spec. Res.  
 Sec. Lt. C. T. Repton, Hrs., attd. R.F.C.

July 14th.

## LEGION D'HONNEUR.

## CROIX D'OFFICIER.

Temp. Brig-Gen. C. A. H. Longcroft, Welsh R.  
 Bt. Lt.-Col. B. D. Fisher, D.S.O., Lrs.

## CROIX DE CHEVALIER.

Bt.-Maj. (temp. Lt.-Col.) E. R. Ludlow-Hewitt, M.C., R. Irish Rif. and R.F.C.  
 Maj. I. A. E. Edwards, R.A. and R.F.C.  
 Capt. (temp. Maj.) C. G. S. Gould, R.A. and R.F.C.  
 Capt. (temp. Maj.) F. M. Roxby, N. Staffs R., Spec. Res., and R.F.C.  
 Capt. E. R. L. Corballis, R. Dub. Fus. and R.F.C.  
 Lt. (temp. Capt.) A. McR. Moffat, Arg. and Sutthd. Highrs. and R.F.C.  
 Sec. Lt. (temp. Lt.) R. Gregory, Conn. Rgrs., Spec. Res., and R.F.C.

## CROIX DE GUERRE.

Lt. F. E. Brown, R. Dub. Fus., Spec. Res., and R.F.C.  
 Temp. Capt. C. M. Clement, Gen. List and R.F.C.  
 Sec. Lt. J. E. De Watteville, Cam. Highrs. and R.F.C.  
 Sec. Lt. (temp. Lt.) C. M. Down, Herts R. and R.F.C.  
 Temp. Sec. Lt. C. G. Durham, Gen. List and R.F.C.  
 Sec. Lt. (temp. Lt.) A. H. George, Ches. R. and R.F.C.  
 Temp. Sec. Lt. (temp. Capt.) H. J. Larkin, Gen. List and R.F.C.  
 Lt. (temp. Maj.) L. W. Learmount, M.C., R.F.C., Spec. Res.  
 Sec. Lt. (temp. Capt.) T. Macleod, R.F.C., Spec. Res.  
 Temp. Sec. Lt. E. R. Pennell, Gen. List and R.F.C.  
 Temp. Sec. Lt. J. R. Smith, Gen. List and R.F.C.  
 Temp. Capt. P. D. Stuart, Gen. List and R.F.C.  
 Temp. Sec. Lt. B. A. Taylor, R.F.C.  
 Temp. Capt. R. N. Thomas, Gen. List and R.F.C.  
 14956 1st Cl. Air Mech. (actg. Cpl.) A. Beebee, R.F.C.  
 65005 2nd Cl. Air Mech. W. Harper, R.F.C.  
 51088 2nd Cl. Air Mech. H. McMillan, R.F.C.

## MEDAILLE MILITAIRE.

77354 2nd Cl. Air Mech. E. Bowen, R.F.C.  
 7504 Serjt. J. Brown, R.F.C.  
 4240 Cpl. J. Richmond, R.F.C.  
 12315 2nd Cl. Air Mech. E. H. Sayers, R.F.C.  
 8197 1st Cl. Air Mech. E. Trehearn, R.F.C.

Aug. 21st.

## LEGION D'HONNEUR.

## CROIX D'OFFICIER.

Brev. Lt.-Col. Duncan Sayre MacInnes, C.M.G., D.S.O., R.E.  
 Brev. Lt.-Col. Duncan Le Geyt Pitcher, Indian Army.

## CROIX DE CHEVALIER.

Temp. Lt.-Col. William Dawson Beatty, R.E.  
 Col. (temp. Brig.-Gen.) Walter Buckingham Caddell, R.A.  
 Temp. Hon. Col. John Dewar Cormack, C.M.G.  
 Actg. Maj. William Middleship Cooper, M.C., R.A.  
 Brev. Lt.-Col. John Tuthill Dreyer, D.S.O., R.A.

Aug. 31st.

## LEGION D'HONNEUR.

## CROIX DE CHEVALIER.

Brev. Maj. (temp. Lt.-Col.) J. E. Tennant, M.C., Scots Gds. and R.F.C.

## MEDAILLE MILITAIRE.

Z.92 Flt. Serjt. A. J. Adams, R.F.C.

Sept. 26th.

## CROIX DE GUERRE.

Lt. (temp. Capt.) L. J. Bayly, R.G.A. and R.F.C.

Dec. 17th.

## LEGION D'HONNEUR.

## CROIX D'OFFICIER.

Maj. (temp. Brig.-Com.) J. H. W. Becke, D.S.O., Notts and Derby Regt.  
 Temp. Lt.-Col. the Hon. A. S. BYNG, Gen. List and R.F.C.

## THE HONOURS LIST OF R.F.C. IN 1917.

## Foreign Decorations (continued)

## CROIX DE CHEVALIER.

Capt. I. P. R. NAPIER, Arg. and Suthd. Highrs. and R.F.C.

## CROIX DE GUERRE.

Lt. (temp. Capt.) W. L. BIRCH, W. Yorks R. and R.F.C.

Sec. Lt. (temp. Lt.) J. H. BROADWAY, Dorset R. and R.F.C.

Sec. Lt. D. A. GLEN, late R.F.C.

Temp. Sec. Lt. H. A. JONES, Wilts R. and R.F.C.

Sec. Lt. (temp. Lt.) J. W. D. LEIGH, Noth'n Cyclist Bn. and R.F.C.

Sec. Lt. (temp. Lt.) F. W. H. THOMAS, Staffs Yeo. and R.F.C.

Temp. Capt. Sir D. J. WERNHER, Bt., A.S.C. and R.F.C.

CONFERRED BY HIS IMPERIAL MAJESTY THE CZAR OF RUSSIA. Feb. 15th, 1917.

To date from Sept. 12th, 1916.

## ORDER OF ST. GEORGE, 4TH CLASS.

Sec. Lt. (temp. Capt.) A. Ball, D.S.O., M.C., Notts and Derby R. and R.F.C.

## ORDER OF ST. ANNE, 3RD CLASS (WITH SWORDS).

Capt. (temp. Lt.-Col.) J. G. Hearson, D.S.O., R.E. and R.F.C.

Capt. (temp. Lt.-Col.) P. L. W. Herbert, Notts and Derby R. and R.F.C.

Maj. (temp. Lt.-Col.) F. W. Richey, R.A. and R.F.C.

## ORDER OF ST. STANISLAS, 2ND CLASS (WITH SWORDS).

Capt. (temp. Lt.-Col.) A. E. Borton, D.S.O., R. Highrs. and R.F.C.

Capt. (temp. Maj.) R. G. Cherry, R.F.A. and R.F.C.

Capt. (temp. Maj.) A. Christie, R.A., and R.F.C.

Capt. (temp. Lt.-Col.) P. H. L. Playfair, M.C., R.A. and R.F.C.

## MEDAL OF ST. GEORGE, 1ST CLASS.

1465 Serjt. R. B. Mumford, R.F.C.

364 Actg. Serjt.-Maj. G. Thornton, R.F.C.

5800 Actg. Serjt. J. H. Waller, R.F.C.

## 3RD CLASS.

13687 Cpl. H. Young, R.F.C.

## 4TH CLASS.

6326 1st Cl. Air Mech. J. I. T. Jones, R.F.C.

## CONFERRED BY THE KING OF ITALY.

May 26th.

## THE ORDER OF ST. MAURICE AND ST. LAZARUS.

## CAVALIER.

Lt. (temp. Maj.) S. A. Currin, R.F.C., Spec. Res.

Maj. (temp. Lt.-Col.) N. A. Orr-Ewing, D.S.O., Scots Gds.

Capt. (temp. Maj.) T. V. Smith, M.C., R.F.C., Spec. Res.

## THE SILVER MEDAL FOR MILITARY VALOUR.

Temp. Sec. Lt. (temp. Capt.) A. W. Bird, Gen. List and R.F.C.

Sec. Lt. G. G. Callender, R.F.C., Spec. Res.

Lt. (temp. Capt.) H. E. Hartney, Special List and R.F.C.

Lt. (temp. Capt.) H. W. G. Jones, Welsh R. and R.F.C.

Temp. Lt. (temp. Capt.) J. M. McAlery, Gen. List and R.F.C.

Sec. Lt. F. H. B. Selous, R. West Surr. R. and R.F.C.

Capt. A. W. Tedder, Dorset R. and R.F.C.

## THE BRONZE MEDAL FOR MILITARY VALOUR.

12188 1st Cl. Air Mech. G. W. Allen, R.F.C.

4790 Serjt. J. H. Booth, R.F.C.

40286 2nd Cl. Air Mech. R. H. Calcutt, R.F.C.

11820 Serjt. J. A. Cuniffe, R.F.C.

2679 Serjt. G. H. Currall, R.F.C.

5025 Serjt. J. H. R. Green, R.F.C.

2124 Cpl. C. S. Hosegood, R.F.C.

3403 Serjt. W. Joiner, R.F.C.

3053 Cpl. H. G. W. Lock, R.F.C.

9606 Cpl. S. W. Machin, R.F.C.

3685 Flt. Serjt. G. Marriner, R.F.C.

1933 Flt. Serjt. P. Warner, R.F.C.

## SILVER MEDAL FOR MILITARY VALOUR.

Lt. (temp. Capt.) G. D. Gardner, Yorks R. and R.F.C.

## CONFERRED BY THE KING OF THE BELGIANS.

## ORDRE DE LEOPOLD.

Sept. 24th.

## COMMANDEUR.

Maj.-Gen. H. M. Trenchard, C.B., D.S.O.

## CHEVALIER.

Temp. Capt. N. A. Bolton, Gen. List and R.F.C.

Lt. (temp. Capt.) C. M. B. Chapman, M.C., E. Kent R. and R.F.C.

Sec. Lt. (temp. Capt.) J. M. Child, Manch. R. and R.F.C.

Lt. (temp. Capt.) J. C. Russell, R.E. and R.F.C.

Sec. Lt. (temp. Capt.) J. C. Slessor, M.C., Spec. Res., R.F.C.

## ORDRE DE LA COURONNE.

## OFFICIER.

Lt. (temp. Maj.) J. E. A. Baldwin, Hrs. and R.F.C.

Sec. Lt. (temp. Maj.) L. A. Tilney, Household Cav. and R.F.C.

## CHEVALIER.

Temp. Sec. Lt. S. Cockerell, Gen. List and R.F.C.

Temp. Sec. Lt. J. H. O. Jones, Gen. List and R.F.C.

Sec. Lt. (temp. Lt.) F. Tymms, M.C., S. Lanc. R. and R.F.C.

Temp. Lt. W. A. Wright, Gen. List and R.F.C.

## DECORATION MILITAIRE.

22025 Serjt. R. O. Campbell, R.F.C. (Canada).

65088 Serjt. F. Reeday, R.F.C. (Stockport).

7420 1st Cl. Air Mech. C. M. Reynolds, R.F.C. (Birkenhead).

78780 Cpl. E. H. Rich, R.F.C. (Lea Bridge, E.).

12267 2nd Cl. Air Mech. F. N. Taylor, R.F.C. (Slough).

79087 2nd Cl. Air Mech. A. Tibbles, R.F.C. (Kentish Town, N.W.).

## ORDRE DE LEOPOLD.

## CHEVALIER.

Capt. (temp. Lt.-Col.) R. R. Smith-Barry, Flying School.

Capt. (temp. Maj.) the Hon. L. J. E. Twisleton-Wykeham-Fiennes, Oxf. and Bucks L.I. and R.F.C.

## ORDRE DE LA COURONNE.

## GRAND OFFICIER.

Lt.-Gen. Sir D. Henderson, K.C.B., D.S.O., Director-General of Mil. Aeronautics.

## OFFICIER.

Maj. (temp. Lt.-Col.) C. F. de S. Murphy, D.S.O., M.C., R. Berks R. and R.F.C.

## CONFERRED BY H.M. THE KING OF SERBIA.

Sept. and Oct., 1916.

## ORDER OF THE WHITE EAGLE, 5TH CLASS (WITH SWORDS).

Temp. Capt. C. H. Elliott-Smith, Gen. List and R.F.C.

## ORDER OF KARAGEORGE, 4TH CLASS (WITH SWORDS).

Lt. (temp. Capt.) Lord Lucas, Yeomanry and R.F.C.

## CROSS OF KARAGEORGE, 2ND CLASS (WITH SWORDS)

3575 Cpl. R. James, R.F.C.

## SILVER MEDAL.

4118 1st Cl. Air Mech. G. Hodgson, R.F.C.

1513 Cpl. H. Miller, R.F.C.

Aug. 27th, 1916.

## ORDER OF KARAGEORGE.

Lt. (temp. Capt.) J. O. C. Orton, Norf. R. and R.F.C.

## CROSS OF KARAGEORGE, 1ST CLASS (WITH SWORDS).

30 Actg. Serjt.-Maj. W. Jones, R.F.C.

## GOLD MEDAL.

1479 1st Cl. Air Mech. R. F. Fillmore, R.F.C.

Oct. 3rd.

## ORDER OF THE WHITE EAGLE, 4TH CLASS (WITH SWORDS).

Temp. Capt. Gilbert Ware Murlis Green, D.S.O., M.C., Gen. List and R.F.C.

## CONFERRED BY THE KING OF MONTENEGRO.

Oct. 31st, 1916.

## SILVER MEDAL FOR BRAVERY.

Sec. Lt. (temp. Capt.) John Oliver Andrews, M.C., R. Scots and R.F.C.

Sec. Lt. Arthur Lionel Gordon-Kidd, R.F.C.

## CONFERRED BY THE SULTAN OF EGYPT.

Oct. 31st, 1916.

## ORDER OF THE NILE, 4TH CLASS.

Capt. Stuart Grant-Dalton, D.S.O., Yorks R. and R.F.C.

Maj. Arthur Justin Ross, D.S.O., R.E. and R.F.C.

Temp. Capt. Helperus Andrias Van Ryneveld, M.C., R.F.C.

## SPECIAL PROMOTIONS AND APPOINTMENTS.

Jan. 24th.

## TO BE LIEUT.-GENERAL.

Maj.-Gen. (temp. Lt.-Gen.) Sir D. Henderson, K.C.B., D.S.O.

## TO BE BREVET COLONEL.

Maj. and Bt. Lt.-Col. (temp. Brig.-Gen.) W. S. Brancker, R.A.

## TO BE BREVET MAJORS.

Capt. (temp. Lt.-Col.) W. R. Freeman, D.S.O., M.C., Manch. R. and R.F.C.

Capt. (temp. Lt.-Col.) F. V. Holt, D.S.O., Oxf. and Bucks L.I. and R.F.C.

Capt. (temp. Maj.) C. E. C. Rabagliati, M.C., York. L.I. and R.F.C.

## TO BE BREVET MAJOR ON PROMOTION TO THE RANK OF CAPTAIN.

Lt. (temp. Capt.) S. W. Smith, R.A. and R.F.C.

March 9th.

Bt. Maj. G. S. Shephard, M.C., R. Fus. (from Wing Comdr. and temp. Lt.-Col., R.F.C.), and to be temp. Brig.-Gen. whilst so empld.

March 17th.

TO BE BREVET MAJOR.—Capt. (temp. Lt.-Col.) J. E. Tennant, M.C., Scots Gds. and R.F.C.

April 10th.

To be Dep. Dir.-Gen.—Bt. Col. (temp. Brig.-Gen.) W. S. Brancker, R.A., from a Dir., and to retain his temp. rank whilst so empld., Feb. 28th.

Dir.—Bt. Lt.-Col. L. E. O. Charlton, C.M.G., D.S.O., Lanc. Fus., from a G.S.O., 1st Grade, and to be temp. Brig.-Gen. whilst so empld., vice Bt. Col. (temp. Brig.-Gen.) Brancker, R.A., Feb. 28th.

April 15th.

HIS MAJESTY THE KING TO BE COLONEL-IN-CHIEF OF THE ROYAL FLYING CORPS (NAVAL AND MILITARY WING).



## THE HONOURS LIST OF R.F.C. IN 1917.

## Special Promotions and Appointments (continued).

May 4th.

The following temp. appts. are made at the War Office:—

Dir.—Bt. Lt.-Col. W. B. Caddell, R.A., from an Asst. Dir., and to be temp. Brig.-Gen. whilst so empld., vice Bt. Lt.-Col. D. S. MacInnes, C.M.G., D.S.O., R.E., April 4th.

June 2nd.

To be Brevet Lieut.-Col.—Maj. (temp. Lt.-Col.) G. W. P. Dawes, D.S.O., R. Berks R. and R.F.C.

July 20th.

Bt. Col. (temp. Brig.-Gen.) W. S. Brancker, R.A., to be temporary Major-General whilst empld. as Deputy Director-General of Military Aeronautics, June 22nd, 1917.

July 28th.

Brig. Comdrs.—From Group Comdrs., R.F.C., and to be temp. Brig.-Gens. whilst so empld.:—Maj. (temp. Col.) H. C. T. Dowding, R.A.; Bt. Maj. (temp. Col.) P. L. W. Herbert, Notts and Derby R., June 22nd.

Aug. 28th.

Brigade Comdr.—Capt. (temp.) Lt.-Col. C. G. Hoare, Indian Cavalry, from a Wing Comdr., and to be temp. Brig.-Gen. whilst so empld., Aug. 1st, 1917.

Sept. 1st.

Brig.-Gen., R.F.C. Staff.—(Graded as a Brig.-Comdr.)—Maj. (temp. Lt.-Col.) G. Livingston, C.M.G., Lond. R., T.F., from a Staff Officer, R.F.C., 1st Cl. (graded as an A.A.G.), and to be temp. Brig.-Gen. whilst so empld., Aug. 9th.

Sept. 3rd.

Comdr.—Bt. Col. (temp.) Brig.-Gen. E. B. Ashmore, C.M.G., M.V.O., R.A., and to be temp. Maj.-Gen. whilst so empld., July 30th, 1917.

Sept. 4th.

Bt. Lt.-Col. (temp. Brig.-Gen.) J. M. Salmond, C.M.G., D.S.O., R. Lanc. R., to be temp. Maj.-Gen., June 22nd.

Sept. 15th.

Brig.-Comdr.—Maj. (temp. Col.) T. C. R. Higgins, R. Lanc. R., and to be temp. Brig.-Gen. whilst so empld., Sept. 1st, 1917.

Oct. 20th.

The following temp. appts. are made at the War Office:—Dir.—Capt. (temp. Lt.-Col.) F. C. Jenkins, R.F.C., Spec. Res., from an Asst. Dir., and to be temp. Brig.-Gen. while so empld., Aug. 31st.

Oct. 29th.

The following temp. appts. are made at the War Office:—Dir.-Gen. of Mil. Aeronautics.—Bt. Lt.-Col. (temp. Maj.-Gen.) J. M. Salmond, C.M.G., D.S.O., R. Lanc. R., and to retain his temp. rank whilst so empld., vice Lt.-Gen. Sir D. Henderson, K.C.B., D.S.O., Oct. 18th.

Nov. 2nd.

The King has been pleased, by Letters Patent under the Great Seal of the United Kingdom of Great Britain and Ireland, bearing date Oct. 18th, to appoint:—

Maj. and Bt. Lt.-Col. (temp. Maj.-Gen. John Maitland Salmond, C.M.G., D.S.O., to be a member of his Majesty's Army Council.

Nov. 10th.

Brig.-Comdr.—Bt. Lt.-Col. (temp. Brig.-Gen.) L. E. O. Charlton, C.M.G., D.S.O., Lanc. Fus., from a Dir. at the War Office, and to retain his temp. rank whilst so empld., vice Bt. Lt.-Col. (temp. Maj.-Gen.) C. A. H. Longcroft, Welsh R., Oct. 18th, 1917.

TEMP. APPOINTMENT AT THE WAR OFFICE.—Director.—Maj. (temp. Brig.-Gen.) G. Livingston, C.M.G., Lond. R., T.F., from a Brig.-Gen., R.F.C. Staff (graded as a Brig.-Comdr.), and to retain his temp. rank whilst so empld., vice Bt. Lt.-Col. (temp. Brig.-Gen.) L. E. O. Charlton, C.M.G., D.S.O., Lanc. Fus., Oct. 18th, 1917.

MEMORANDA.—Bt. Lt.-Col. (temp. Brig.-Gen.) C. A. H. Longcroft, Welsh R., to be temp. Maj.-Gen., Oct. 18th, 1917.

Nov. 12th.

Brig.-Comdr.—Bt. Maj. (temp. Lt.-Col.) E. R. Ludlow-Hewitt, M.C., R. Ir. Rif., from a Wing Comdr., R.F.C., and to be temp. Brig.-Gen. whilst so empld., vice Bt. Maj. (temp. Col.) P. L. W. Herbert, Notts and Derby R., Oct. 17th.

Nov. 24th.

Insp. of Training, Training Div.—Bt. Maj. (temp. Brig.-Gen.) E. R. Ludlow-Hewitt, M.C., R. Ir. Rif., a Brig.-Comdr., and to retain his temp. rank whilst so empld., Nov. 7th.

Dec. 7th.

His Majesty the King has been pleased to approve of the promotion to Brevet Col. of Major and Brevet Lt.-Col. (temporary Major-General) John Maitland Salmond, C.M.G., D.S.O., Royal Lancaster Regiment, Director-General of Military Aeronautics, in recognition of his distinguished services.

Jan. 1st, 1918.

TO BE BREVET COLONEL.

Brig.-Gen. E. L. ELLINGTON, C.M.G., R.A.

Brig.-Gen. J. F. A. HIGGINS, D.S.O., R.A.

Brig.-Gen. J. H. W. BECKE, D.S.O., Notts. and Derby R. and R.F.C.

Brig.-Gen. G. S. SHEPHARD, D.S.O., M.C., R. Fus.

TO BE BREVET MAJOR.

Lt.-Col. E. H. DAVIDSON, M.C., Gord. Highrs. and R.F.C.

Lt.-Col. G. F. PRETYMAN, D.S.O., Som. L.I., attd. R.F.C.

TO BE LT.-COL.

Brig.-Gen. T. C. R. HIGGINS, R. Lan. R.

Brig.-Gen. R. E. T. HOGG, C.I.E., I.A. and R.F.C.

Brig.-Gen. G. LIVINGSTON, C.M.G., Lond. R. and R.F.C.

TO BE BT. MAJOR.

Lt.-Col. U. J. D. BOURKE, Oxf. and Bucks. L.I. and R.F.C.

Capt. J. F. DYER, E. Lancs. R. and R.F.C.

Lt.-Col. B. S. FOSTER, Hamps. R. and R.F.C.

Lt.-Col. A. HUGGINS, D.S.O., R.F.C., Spec. Res.

Brig.-Gen. F. C. JENKINS, R.F.C., Spec. Res.

Capt. Sir N. R. A. D. LESLIE, Bt., Ind. Cav. and R.F.C.

Capt. G. D. PIDGEON, R.F.C., Spec. Res.

Lt.-Col. R. R. SMITH-BARRY, R.F.C., Spec. Res.

TO BE HONORARY MAJOR.

Lt.-Col. F. H. KIRBY, V.C., R.F.C.

\* \* \*

For valuable services rendered in connection with the War (dated Jan. 1st, 1918):—

## PROMOTIONS FROM THE RANKS FOR SERVICES IN THE FIELD.

[The following warrant officers, non-commissioned officers, and men have been promoted direct to commissioned rank as Sec. Lt. for service in the field. Promotions "on probation" are not included in the list. The dates given are the dates of the "Gazette" in which the promotions were made.—ED.]

Jan. 12th.

For duty with R.F.C.—Cpl. D. H. Simmons, from R.F.C., Dec. 10th, 1916; Serjt. H. Brown, from R.F.C., Dec. 18th, 1916.

Jan. 24th.

For duty with R.F.C.—Serjt.-Maj. G. Felstead, from R.F.C., Dec. 19th, 1916; Flt. Serjt. J. Noakes, from R.F.C.; Flt. Serjt. J. B. McCudden, from R.F.C., Jan. 1st.

March 14th.

For duty with R.F.C.—Serjt. R. N. L. Munro, from R.F.C., Feb. 16th.

March 22nd.

REGULAR FORCES.—INFANTRY.—SOM. L.I.—Serjt.-Maj. J. Bullock, from R.F.C., Feb. 20th, seny. from Dec. 14th, 1916, and to be secd. for duty with the R.F.C.

For duty with R.F.C.—Actg. Serjt.-Maj. W. C. Hayward, from R.F.C., Feb. 19th.—1st. Cl. Air Mech. F. Crompton, from R.F.C., Feb. 7th; Serjt. G. O. Smart, from R.F.C., Feb. 21st; Serjt. R. G. Malcom, from R.F.C., Feb. 24th.

April 16th.

REGULAR FORCES.—INFANTRY.—SOM. L.I.—Serjt. E. Porter, from R.F.C., and to be secd. for duty with the R.F.C., March 11th.

For duty with R.F.C.—Serjt. W. T. Walder, March 10th; Serjt. E. C. E. Derwin, March 16th.

April 20th.

For duty with the R.F.C.—Serjt. T. K. Breakell, from R.F.C., March 19th.

April 30th.

For duty with R.F.C.—Serjt. Ernest Jones, from R.F.C., April 2nd, 1917.

May 7th.

For duty with R.F.C.—Actg. Serjt.-Maj. T. Bell, from R.F.C., April 3rd.

THE ARMY SERVICE CORPS.—1st Cl. Air Mech. A. S. Hansford, from R.F.C.

May 26th.

For duty with R.F.C.—Actg. Serjt.-Maj. C. Mullen, from R.F.C., April 10th.

For duty with R.F.C.—Flt. Serjt. C. Ryder, from R.F.C., April 21st.

June 2nd.

For duty with R.F.C.—Serjt. W. B. Thomson, from R.F.C., May 4th.

June 20th.

REGULAR FORCES.—CORPS OF ROYAL ENGINEERS.—2nd Cl. Air Mech. Herbert Charles Gray, from R.F.C., May 12th, 1917.

June 21st.

Serjts., from R.F.C., to be temp. Sec. Lts. for duty with the Mil. Wing of that Corps:—J. G. O'Giollagain, May 29th; R. F. Round, June 8th.

July 31st.

N.C.Os. to be temp. Sec. Lt. (on prob.) for duty with the R.F.C.—Serjt. H. R. Griffin, from R.F.C., June 25th.

## THE HONOURS LIST OF R.F.C. IN 1917.

## Special Promotions (continued).

Aug. 16th.

REGULAR FORCES.—The A.S.C.—Cpl. F. W. Southgate, from R.F.C.

For duty with R.F.C.—Serjt. H. S. Starling, from R.F.C., June 25th.

Aug. 23rd.

For duty with R.F.C.—Serjt. C. H. N. Nunn, from R.F.C., July 2nd.

Aug. 27th.

For duty with R.F.C.—1st Cl. Air Mech. E. A. Clear, from R.F.C., April 28th; Cpl. G. O. Lowe, from S.A., R.F.C.; 1st Cl. Air Mech. H. Spencer, from S.A., R.F.C.; 2nd Cl. Air Mech. C. W. G. Ratsey, from S.A., R.F.C.; 2nd Cl. Air Mech. A. K. Prentice, from S.A., R.F.C.; Cpl. C. J. Thomson, from S.A., R.F.C.

Sept. 6th.

R.F.C.—MIL. WING.—1st Cl. Air Mech. H. M. Haines, May 17th. 2nd Cl. Air Mech. R. A. Davey; 2nd Cl. Air Mech. L. G. Candy, from S.A., R.F.C., June 22nd. 1st Cl. Air Mech. L. Hawkins, June 23rd. Flt. Serjt. F. Little, June 26th. 1st Cl. Air Mech. C. F. Cotton, June 27th.

Sept. 19th.

R.F.C.—MIL. WING.—Actg. Serjt.-Maj. E. Maynell, July 22nd. 1st Cl. Air Mech. J. J. Williamson, July 27th.

Oct. 5th.

R.F.C.—MIL. WING.—Actg. Serjt.-Maj. J. H. Ferguson, Aug. 17th. 2nd Cl. Air Mech. F. C. Griffin, Serjt.-Maj. C. W. Brown, Sept. 3rd; Serjt. W. F. Mayoss, Sept. 1st; Flt. Serjt. W. W. Grant, Sept. 5th.

Oct. 9th.

R.F.C.—MIL. WING.—Actg. Serjt.-Maj. A. M. Cawthra, Sept. 14th.

Nov. 10th.

Temp. Serjt.-Maj. Noel Hemsley, from R.F.C., to be Sec. Lt., Sept. 17th, 1917.

THE FOLLOWING HONOURS HAVE BEEN CONFERRED ON THOSE CONNECTED WITH BRITISH AERONAUTICS BUT NOT IN THE FLYING SERVICES:—

## Order of the Bath.

Feb. 11th.

For services during the war:—  
TO BE ORDINARY MEMBER OF THE CIVIL DIVISION OF THE THIRD CLASS, OR COMPANION, OF THE SAID MOST HONOURABLE ORDER.  
Col. JOHN GEORGE, DUKE OF ATHOLL, M.V.O., D.S.O., Scottish Horse (Yeo.).

## Order of the British Empire. Aug. 24th.

The King has been pleased to Command, as Sovereign of the Most Excellent Order of the British Empire, that the following persons shall be admitted to the Order in the classes mentioned:—

## KNIGHT GRAND CROSS.

LORD SYDENHAM, G.C.M.G., etc.

Has rendered special services in connection with the Air Board and also as Chairman of a Royal Commission on Public Health.

## KNIGHTS COMMANDERS.

HERBERT AUSTIN, Esq.

Has rendered valuable services in the production of the Munitions of War.

DUGALD CLERK, Esq.

Member of the Panel of Board of Invention and Research, Admiralty, Member of the Ministry of Munitions Inventions Department, Member of the Trench Warfare Advisory Panel.

ALFRED EDWARD HERBERT, Esq.

Deputy Director-General in charge of the Machine Tool Division and Chairman of the Machine Tool Committee, Ministry of Munitions.

## COMMANDERS.

LEONARD BAIRSTOW, Esq., F.R.S.

Chief of Aero-dynamics Department, National Physical Laboratory.

CHARLES WILLIAM BRYANT, Esq.

Managing Director of Brotherhoods (Limited).

Lt.-Col. HENRY FOWLER.

Late Director in the Gun Ammunition Division, Ministry of Munitions.

PERCY JOHN PYBUS, Esq.

Has rendered valuable services to the Labour Supply Department of the Ministry of Munitions.

## MEMBER.

Russell Clarke, Esq.

Aviation Electrician, Telegraphist, etc., Admiralty.

## KNIGHTHOODS.

Feb. 11th.

His Majesty has been pleased to confer the honour of Knighthood upon:—

WILLIAM WEIR, Esq.

June 6th.

His Majesty has been pleased to confer the honour of Knighthood upon:—

RICHARD TETLEY GLAZEBROOK, C.B.

## Foreign Decorations.

CONFERRED BY THE PRESIDENT OF THE FRENCH REPUBLIC.

Aug. 22nd.

## CROIX DE CHEVALIER.

Maj. JOHN LAWRENCE BAIRD, C.M.G., D.S.O., S.P., D.L., M.P., Yeo. (Parliamentary Secretary to the Air Board, and Deputy Chairman of the Civil Aerial Transport Committee).

DECORATION CONFERRED BY THE KING OF ITALY.

## ORDER OF ST. MAURICE AND ST. LAZARUS.

GRAND OFFICER.—Rear-Admiral MARK E. F. KERR, C.B., M.V.O.

CONFERRED BY H.M. THE KING OF SERBIA.

Sept. and Oct., 1916.

## ORDER OF THE WHITE EAGLE, 3RD CLASS (WITH SWORDS).

Lt.-Col. Comdt. and Hon. Col. (temp. Brig.-Gen.) J. G. MARQUESS OF TULLIBARDINE, M.V.O., D.S.O., Yeo.

## Special Appointments.

March 16th.

The King has been pleased, by Warrant under His Majesty's Royal Sign Manual, bearing date the 15th inst., to direct a Commission to be passed under the Seal appointed to be kept and made use of in place of the Great Seal of Scotland, appointing John George, Duke of Atholl, to be His Majesty's Lt. of the County of Perth, in the room of John James Hugh Henry.

June 23rd.

ATTACHED TO HD.-QR. UNITS.—Brig.-Comdr.—Lt.-Col. Comdt. J. G., Duke of Atholl, C.B., M.V.O., D.S.O., from Yeo., T.F., and to be temp. Brig.-Gen. while so empld., vice Col. E. D. J. O'Brien, C.B., June 12th.

## MENTIONED IN DISPATCHES.

A special Supplement to the "London Gazette," dated Jan. 25th, contains a list of officers and men mentioned in dispatches, among whom are the following officers and men of the R.F.C.:—  
Birley, Capt. G. H., R. W. Surr. R. and R.F.C.; Black, Capt. C. T., R. War. R. and R.F.C.; Brandon, Capt. A. de B., D.S.O., M.C., R.F.C. (Spec. Res.); Burnett, Maj. C. S., High. L.I. and R.F.C.

Christie, Maj. M. G., M.C., R.F.C. (Spec. Res.).

Fraser, Sec. Lt. H. H. McL., R.F.C. (Spec. Res.).

Gilley, Capt. D., Devon R. and R.F.C.

Hedges, Capt. F. R., R.F.C.; Helpman, Sec. Lt. W. G., King Edward's Horse and R.F.C.; Higgins, Maj. (temp. Lt.-Col.) T. C. R., R. Lanc. R. and R.F.C.; Holt, Capt. (temp. Lt.-Col.) F. V., D.S.O., Oxf. and Bucks L.I. and R.F.C.; Hore, Sec. Lt. C. A., N. Staffs R. and R.F.C.

McClaghry, Capt. W. A., Aust. L.H. and R.F.C.; MacInnes, Maj. and Bt. Lt.-Col. (temp. Brig.-Gen.) D. S., D.S.O., R.E.; Mackay, Sec. Lt. J. I., W. Rid. R. and R.F.C.; Marsh, Maj. A. C. E., R.A. and R.F.C. (Spec. Res.); Morton, Capt. A. H., R.F.A. and R.F.C.; Munsie, Sub-Lt. W. G. C., R.N.V.R. and A.A.C.

Penn-Gaskell, Maj. L. da C., Norf. R. and R.F.C. (killed); Powell, Capt. H. S., Ceylon Rif. and R.F.C.; Pyott, Sec. Lt. I. V., R.F.C. (Spec. Res.).

Richardson, Capt. M. G. F., North'd Fus. and R.F.C.; Ridley, Capt. C. A., D.S.O., M.C., R. Fus. and R.F.C.; Robb, Capt. E. E., R.F.C. (Spec. Res.); Robinson, Capt. W. L., V.C., Worc. R. and R.F.C.; Ruck, Maj.-Gen. R. M., C.B., ret. pay, Res. of Officers.

Sowery, Sec. Lt. F., D.S.O., 12th Bn. R. Fus. and R.F.C.; Sowery, Capt. J., 6th Bn. R. W. Surr. R. and R.F.C.

Tempest, Sec. Lt. W. J., D.S.O., Gen. List and R.F.C.; Thomson, Maj. A. A. B., R. War. R. and R.F.C.; Tomlinson, Capt. H., M.C., R.F.C. (Spec. Res.); Turner, Sec. Lt. McD. C., R.F.C. (Spec. Res.).

Unwin, Maj. E. F., A.S.C. and R.F.C. (killed).

Wilson, Capt. A. C., Lrs. and R.F.C.; Woodhouse, Capt. J. W., M.C., R.F.C. (Spec. Res.).

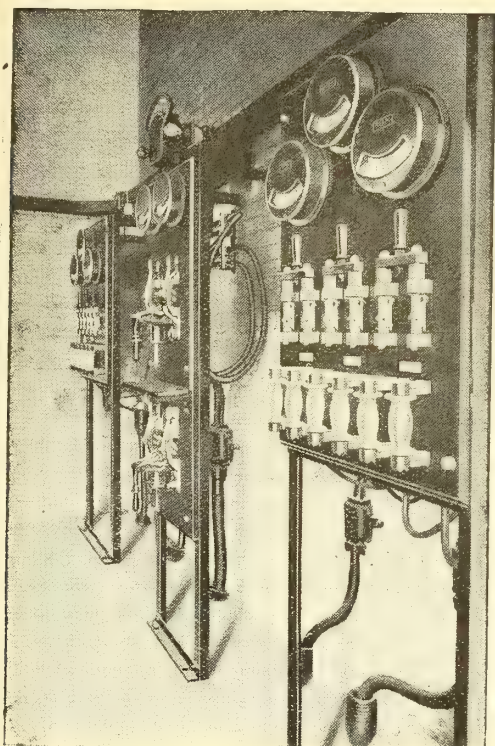
Bastable, No. 9409 Serjt. B. J., R.F.C.; Goodchild, No. 777 Flt. Serjt. C. W., R.F.C.; Held, No. 14285 1st Air Mech. A., R.F.C.; Hutton, No. 1775 Serjt.-Maj. A. E., R.F.C.; Kemp, No. 775 Serjt.-Maj. S. T., R.F.C.; Peck, No. 4758 Flt. Serjt. G. F., R.F.C.

Feb. 8th.

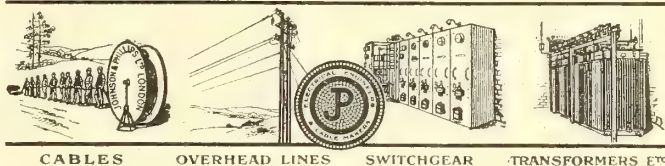
Dispatch from Lt.-Gen. the Hon. J. C. Smuts, C.-in-C., E. Africa:—

Van der Spuy, Temp. Capt. K. R., M.C., Gen. List; Walmesley, Sec. Lt. (temp. Lt.) L., E. Yorks R.; McKiever, Sec. Lt.





SPECIALISTS IN ELECTRICAL TRANSMISSION AND DISTRIBUTION



CABLES OVERHEAD LINES SWITCHGEAR TRANSFORMERS ETC

*The Illustration shows a Low-tension Alternating Current*

## WORKS DISTRIBUTION BOARD

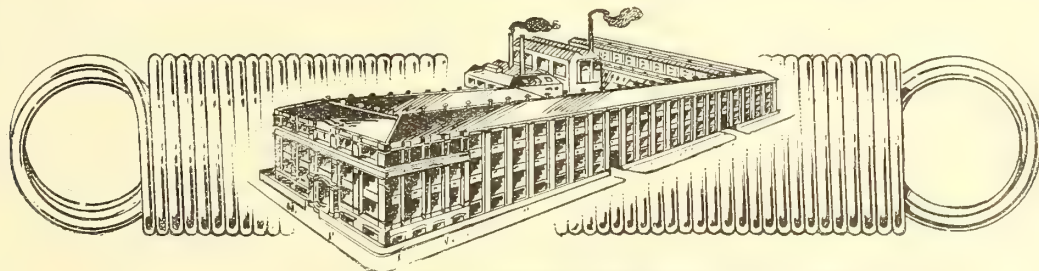
*lately installed by us to control the supply of Power to Motors, Lights, etc., in a well-known Aeroplane Factory.*

*All Cabling, etc., carried out by us.*

12, UNION COURT, OLD BROAD ST., LONDON, E. C. 2

**JOHNSON AND PHILLIPS LTD**  
ELECTRICAL ENGINEERS & CABLE MAKERS  
**CHARLTON, LONDON, S.E. 7.**

BIRMINGHAM CARDIFF GLASGOW MANCHESTER NEWCASTLE-ON-TYNE PORTSMOUTH  
206, Corporation St. 9 Park Place, 159, W. George St. 251, Deansgate 44b, Blackett St. Cleveland Rd Gosport



# TERRY

**In the spring the expert's fancy rightly turns to those by Terry.**

—and they never disappoint under test of service, because of their standard excellence.

MATERIALS—METHODS—HEAT TREATMENTS—each factor and phase of production is specialised by the closest study—Every scientific discovery that would benefit and advance productive excellence is proved—and if worthy installed.

Telephone 81 (4 lines.)  
Telegrams "Springs"  
or Novelty.



**HERBERT TERRY & SONS, Ltd.**  
The Spring and Presswork Specialists,  
**REDDITCH, Eng.**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



## THE HONOURS LIST OF R.F.C. IN 1917.

## Mentioned in Dispatches (continued).

A. V., Sea. Hghrs.; Collender, Temp. Sec. Lt. G. F. F., Gen. List.

Willis, No. Z2 Flt. Serjt. H. L.; Duncan, No. Z42 Flt. Serjt. (actg. Serjt.-Maj.) S. N.; Grant, No. Z185 Flt.-Serjt. D.; Rae, No. Z76 Serjt. R. M.; Reynolds, No. Z222 Serjt. A. E.; Hamblin, No. Z98 Cpl. A. A.; Mathieson, No. Z151 1st Cl. Air Mech. A. H.; Firth, No. Z225 1st Cl. Air Mech. T. (deceased).

Feb. 24th.

The names of the following officers have been brought to the notice of the Secretary of State for War for valuable services rendered in connection with the war:—

Austin-Sparks, Temp. Capt. R. H., Spec. List.  
Bagnall-Wild, Capt. and Bt. Maj. (temp. Lt.-Col.) R. K., R.E. and R.F.C.; Beatty, Bt. Maj. (temp. Lt.-Col.) W. D., R.E. and R.F.C.; Bishop, Temp. Lt. P., R.F.C.; Blackman, Sec. Lt. S., R.F.C.; Bulman, Lt. G. P., R.F.C., Spec. Res.

Campbell, Capt. (temp. Maj.) C. D. M., R.F.C., Spec. Res.; Chaney, Lt. (temp. Maj.) H. E., Lancs. Fus. and R.F.C.; Charlton-Anne, Temp. Capt. C. E. I., Gen. List and R.F.C.; Clark, Capt. A. G., R.F.C.; Collier, Capt. (temp. Lt.-Col.) R. H., R.F.C., Spec. Res.

Dunn, Lt. (temp. Capt.) F., R.F.C., Spec. Res.

Ebben, Lt. (temp. Maj.) H. S., R.F.C., Spec. Res.

Farren, Temp. Capt. W. S., R.F.C.

Gattie, Temp. Sec. Lt. V. R. M., empld. R.F.C.; Goodden, Temp. Maj. F. W., R.F.C.; Green, Temp. Capt. F. M., R.F.C. (T.F.); Grinstead, Temp. Capt. H., R.F.C.

Hall, Temp. Lt. L. H., R.F.C.; Heckstall-Smith, Temp. Maj. S., R.F.C. (T.F.); Henderson, Temp. Maj. G. L. P., R.F.C., Spec. Res.; Hiscocks, Temp. Capt. S. W., R.F.C. (T.F.).

Jenkins, Capt. F. C., R.F.C.

Lindsay, Capt. H. E. A., R.F.C.; Livingston, Temp. Lt.-Col. G., Lond. R. and R.F.C.; Low, Capt. A. M., R.F.C.; Lyons, Qrmr. and Hon. Lt. (temp. Capt.) T., R.F.C.

Murphy, Qrmr. and Hon. Lt. (temp. Capt.) A. G., R.F.C.

O'Caffrey, Lt. P. C. M., R.N.A.S.

Parkin, Qrmr. and Hon. Lt. (temp. Capt.) J. E., R.F.C.; Payne, Qrmr. and Hon. Lt. (temp. Capt.) S. J., R.F.C.; Perrin, Sec. Lt. (temp. Capt.) E. S., R.F.C., Spec. Res.

Sadler, Capt. L., R.F.C.; Saunders, Maj. (temp. Lt.-Col.) C., Dorset R. and R.F.C.; Short, Temp. Lt. F. A., R.F.C.

Treath, Lt. (temp. Capt.) C. C., N. Lanc. R. and R.F.C.; Turner, Temp. Maj. G. B., R.F.C.; Turner, Maj. L. W. F., R.F.C., Spec. Res.

Westendarp, Temp. Capt. O. A., Lond. R. and R.F.C.; Wheatley, Capt. C. W. C., R.F.C.; Whittington, Lt. C. H., R.F.C.; Wilford, Qrmr. and Hon. Lt. (temp. Capt.) J. H., R.F.C.

Feb. 24th.

The names of the following men have been brought to the notice of the Secretary of State for War for valuable services rendered in connection with the war:—

Adair, No. 8548 1st Air Mech. C., R.F.C.; Annan, No. 6499 Flt.-Serjt. J. O., R.F.C.

Belcher, No. 6080 1st Air Mech. G. E., R.F.C.; Bere, No. 1159 Flt.-Serjt. H., R.F.C.; Bird, No. G/25762 Serjt. J. E., R.F.C.; Bolt, No. 40 Flt.-Serjt. (actg. Serjt.-Maj.) E., R.F.C.; Bryant, No. 1440 Actg. Serjt.-Maj. F. H., R.F.C.; Bull, No. 4410 Flt.-Serjt. H., R.F.C.

Calnan, No. 3706 Flt.-Serjt. F., R.F.C.; Carter, No. 6813 1st Air Mech. D., R.F.C.; Chaplin, No. 29574 Cpl. R. C., R.F.C.; Cockram, No. 1344 Flt.-Serjt. S. W., R.F.C.; Condict, No. 2434 Flt.-Serjt. S. T., R.F.C.; Cooper, No. 2325 1st Air Mech. A. T., R.F.C.; Cunningham, No. 21269 Cpl. W. H. T., R.F.C.; Cutts, No. 6328 1st Air Mech. H., R.F.C.

Donaldson, No. 1020 Flt.-Serjt. R., R.F.C.

Forargue, No. 19460 1st Air Mech. W., R.F.C.

Glasper, No. 5206 Serjt. W. A., R.F.C.; Griffin, No. 33 Serjt.-Maj. F. C., R.F.C.; Groves, No. 4220 Cpl. F. R., R.F.C.

Ham, No. 18664 Cpl. P. C., R.F.C.; Harding, No. 1408 Serjt. R., R.F.C.; Hester, No. 4542 Serjt. F. W., R.F.C.; Hill, No. 2956 Flt.-Serjt. W., R.F.C.; Hiscock, No. 50826 Serjt. E., R.F.C.; Hotchin, No. G/21797 Serjt. H. E., R.F.C.; Houghton, No. 3752 Actg. Serjt.-Maj. A. E., R.F.C.; Howes, No. 1734 Flt. Serjt. R. A., R.F.C.

Johns, No. 13137 Flt.-Serjt. A. D., R.F.C.

Karslake, No. 1423 Serjt.-Maj. H., R.F.C.; Knight, No. 6491 Serjt. A. G., R.F.C.; Knights, No. 8337 Actg. Serjt.-Maj. H., R.F.C.

Lamdin, No. 798 Flt.-Serjt. (actg. Serjt.-Maj.) F., R.F.C.; Lancaster, No. 1850 Flt.-Serjt. E., R.F.C.; Lawson, No. 3965 Actg. Serjt.-Maj. H., R.F.C.; Livermore, P.O. R. A., R.N.A.S.; Loughhead, No. 1289 Actg. Serjt.-Maj. W., R.F.C.

Major, No. 4637, Serjt. J., R.F.C.; Mallett, No. 17, Flt.-Serjt. (actg. Serjt.-Maj.) E., R.F.C.; Matthews, No. 3940 Actg. Serjt.-Maj. J., R.F.C.; Monteith, No. 4037 1st Air Mech. D. K., R.F.C.; Muston, No. 15102 Actg. Cpl. A. J., R.F.C.

Parker, No. 2622 Serjt. G. E., R.F.C.; Pell, No. 19938 Serjt.-Maj. J., R.F.C.; Percival, No. 5991 1st Air Mech. J. F. S., R.F.C.

Ramsden, No. 1216, Actg. Serjt.-Maj. E., R.F.C.; Rancome, No. 22521 Co. Serjt.-Maj. L. A., Norf. R. and R.C.F.; Rumsey, No. 929 Flt.-Serjt. E., R.F.C.

Singleton, No. 14207 1st Air Mech. F., R.F.C.; Smith, No. 3081 1st Air Mech. T. W., R.F.C.; Stronach, No. 960 Flt.-Serjt. J. M. G., R.F.C.

Turner, No. 19987 Actg. Serjt.-Maj. A. W., R.F.C.

Utteridge, No. 2867 Flt.-Serjt. E. W., R.F.C.

Vicars, No. 6186 Flt.-Serjt. R., R.F.C.; Wint, No. 2976 Flt.-Serjt. A. G. H., R.F.C.

Warboys, No. S.R.18 Flt.-Serjt. H., R.F.C.; Wildbore, No. 963 Serjt. R., R.F.C.; Williams, No. 591 Serjt. W. J. L., R.F.C.; Winter, No. 343 Serjt.-Maj. F. E., R.F.C.; Woodcock, No. 10342 Cpl. C. J., R.F.C.

April 5th.

The following name is added to the names of those which have been brought to the notice of the Secretary of State for War for valuable services rendered in connection with the war.—O'Gorman, Lt.-Col. M. J. P., C.B., R.F.C.

WAR OFFICE, May 15th.

The following are mentioned in the dispatch of April 9th received from Field-Marshal Sir Douglas Haig, G.C.B., Commander-in-Chief of the British Armies in France:—

## ROYAL NAVAL AIR SERVICE.

Bromet, Lt. (Actg. Sqdn. Comdr.) G. R.; Huskisson, Flt. Comdr. B. L.; Mackenzie, Temp. Flt. Lt. (temp. Flt. Comdr.) C. R., D.S.O.; Goble, Temp. Flt. Lt. S. J., D.S.C.; Bell, Temp. Flt. Lt. B. C.

STAFF.—Ashmore, Temp. Brig.-Gen. E. B., C.M.G., M.V.O., R.A.; Becke, Temp. Brig.-Gen. J. H. W., D.S.O., Notts and Derby R.

## ROYAL FLYING CORPS.

May 15th.

Ainslie, Lt. (temp. Capt.) E. M. L., Middx. R.

Bailey, Sec. Lt. (temp. Capt.) G. C., D.S.O. (Spec. Res.); Baker, Capt. F. C., D. of Corn. L.I.; Barratt, Capt. (temp. Maj.) A. S., M.C., R.F.A.; Barton, Capt. R. J. F., R. Sco. Fus.; Beal, Temp. Sec. Lt. L. W.; Bird, Temp. Capt. A. W., Gen. List; Bird, Temp. Lt. G. B., M.C., R.F.A.; Boulbee, Temp. Sec. Lt. (temp. Capt.) B. St. J., Gen. List; Bower, Sec. Lt. F., Northd. Fus.; Boyle, Capt. (temp. Lt.-Col.) Hon. J. D., Rif. Brig.; Brearley, Sec. Lt. (temp. Capt.) N., D.S.O., M.C., L'pool R.; Brown, Lt. F. E., R. Dub. Fus.; Buck, Lt. G. S. Lond. R.; Bullen, Sec. Lt. (temp. Capt.) T. F., Som. L.I.

Cadwell, Sec. Lt. (temp. Capt.) K. L., Spec. Res.; Capel, Lt. (temp. Capt.) A. J., Som. L.I.; Chappell, Temp. Sec. Lt. R. W., Gen. List; Child, Sec. Lt. (temp. Lt.) J. M., Gen. List; Clement, Temp. Capt. C. M.; Cogan, Maj. (temp. Lt.-Col.) F. J. L., R.F.A.; Cooper, Temp. Maj. R. A. (Lt. (temp. Capt.) Yeo); Corballis, Capt. E. R. L., R. Dub. Fus.

Davison, Temp. Capt. J. F., Gen. List; De Ross, Temp. Lt. A. G. S., Gen. List (killed); Dowling, Temp. Capt. B. L., Gen. List.

Faithfull, Lt. (temp. Capt.) G. F. H., Ind. Army; Fell, Capt. (temp. Maj.) L. F. R. (Spec. Res.), Frost, Sec. Lt. (temp. Lt.) O. H., Middx. R.; Frost, Sec. Lt. (temp. Lt.) S. G. (Spec. Res.).

Garland, Temp. Sec. Lt. E. J., Gen. List; Gilmour, Sec. Lt. (temp. Lt.) J., Arg. and Suthd. Hghrs.; Godman, Maj. A. L., York R.; Goldsmith, Lt. (temp. Maj.) N., R.A.; Gould, Sec. Lt. (temp. Capt.) J. R., King Edward's Horse (Spec. Res.).

Hall, Sec. Lt. (temp. Lt.) R. W. P., R.F.A.; Hearson, Bt. Maj. (temp. Lt.-Col.) J. G., D.S.O., R.E.

Jerman, Lt. (temp. Capt.) R. H., R.W. Fus.; Jones, Temp. Lt. C. G. (Spec. Res.); Jones, Temp. Lt. R. N. K.

Landon, Capt. (temp. Maj.) J. H. A., Essex R.; Lindquist, Sec. Lt. O., Spec. Res.; Long, Lt. (temp. Capt.) S. H., D.S.O., M.C., Durh. L.I.; Loraine, Capt. (temp. Lt.-Col.) R., M.C., Spec. Res.

M'Alery, Temp. Lt. (temp. Capt.) J. M., Gen. List; McMillan, Sec. Lt. (temp. Capt.) J. C., R. Sco. Fus. (died of wounds); Mulock, Temp. Sec. Lt. (temp. Lt.) H. C., S. Staff. R.; Murray, Lt. (temp. Capt.) K. D. P. (Spec. Res.); Murray, Lt. (temp. Capt.) R. G. H., M.C., Ind. Army

Norris, Temp. Sec. Lt. L. A., R.E.; Norton, Temp. Lt. J. H., Gen. List.

Parker, Capt. G. A., D.S.O., M.C., Northn. R.; Parr, Lt. (temp. Capt.) A. W. C. V., Rif. Brig.; Pillers, Lt. (temp. Capt.) R. K., Northn. R.; Powell, Lt. (temp. Capt.) E. (Spec. Res.).

Reed, Sec. Lt. (temp. Lt.) W. E., R.E.; Routley, Sec. Lt. P. C., Welsh R.; Roxby, Capt. (temp. Maj.) F. M., N. Staff. R.

Shepherd, Bt. Maj. (temp. Brig.-Gen.) G. S., M.C., R. Fus.; Shirley, Sec. Lt. (temp. Capt.) F. L. J., York R.; Stephenson, temp. Lt. R., Gen. List; Summers, temp. Capt. J. K., Gen. List.

Tasker, Sec. Lt. W. T. B. (Spec. Res.); Thompson, Temp. Sec. Lt. J. W. R., Gen. List; Tucker, Lt. (temp. Capt.) C. G. (Spec. Res.).

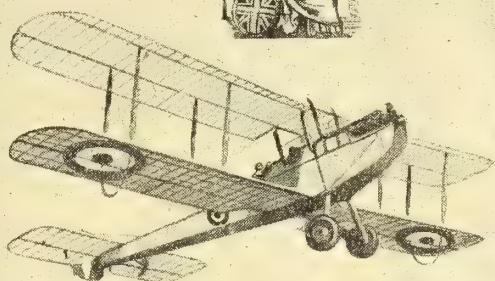


# Britannia Dope

TRADE



MARK



## Britannia Dopes (NON-POISONOUS) and Varnishes

FOR AEROPLANES  
AND SEAPLANES



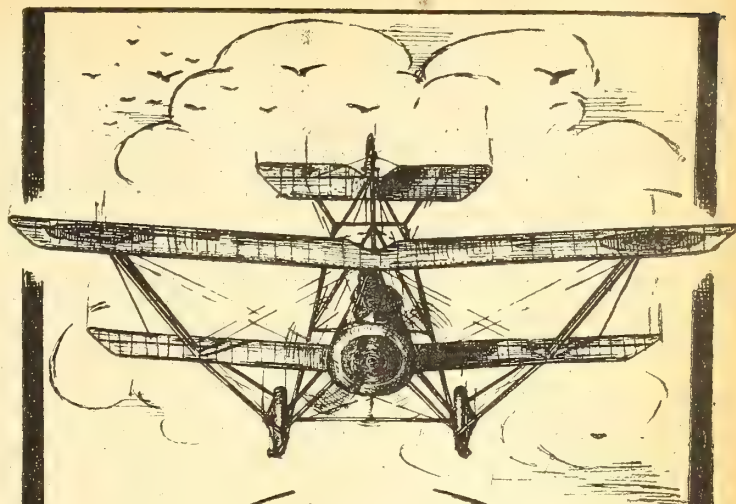
FOR FULL PARTICULARS APPLY  
TO THE APPROVED MAKERS—

### ROBT. INGHAM CLARK & CO. L<sup>TD</sup>.

WALTER HOUSE,  
BEDFORD ST., STRAND, W.C.

Telegrams: "Pearline, Westrand."  
Telephone: Regent 3923.

WORKS .. WEST HAM ABBEY, E.15  
Tel. phone ... East 955 & 9 6



If You Want  
TO LEARN TO FLY,  
Write to  
THE

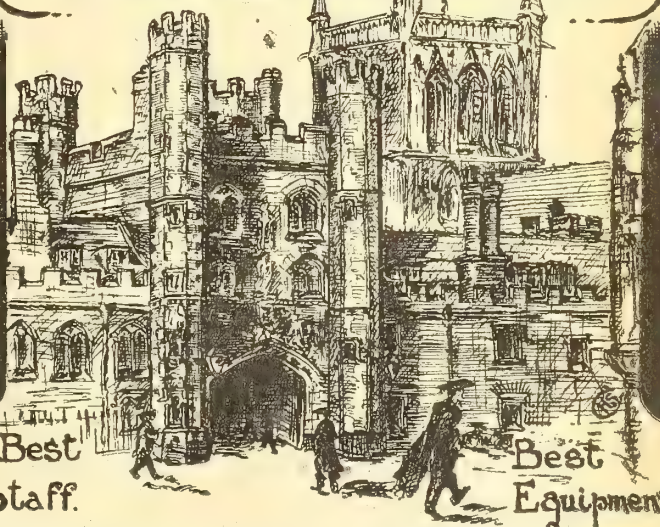
## CAMBRIDGE

SCHOOL OF FLYING  
and Aerodrome Co., Ltd.,  
306, St. Andrew's St., Cambs.,

## TUTORS

of  
Piloting and Aero-engineering  
for their

## 1918 PROSPECTUS.



Best  
Staff.

Best  
Equipment.

Tel: Cambs. 5 and 1086.

Wire: "Carlton", Cambs..

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



## THE HONOURS LIST OF R.F.C. IN 1917.

## Mentioned in Dispatches (continued).

Vaisey, Sec. Lt. C. T. H. (Spec. Res.) (died of wounds); Vincent, Lt. (temp. Capt.) S. F. (Spec. Res.); Whitelock, Lt. (temp. Maj.) A. T. (Spec. Res.); Williams, Temp. Lt. E. L.; Winter, Lt. (temp. Capt.) T. W. (Spec. Res.); Wise, Capt. (temp. Lt.-Col.) P. K., R. War. R.; Young, Sec. Lt. F. C. (Spec. Res.) (killed).

Adams, No. 15723 Cpl. A. E.; Allen, No. 1674 Flt. Serjt. (Actg. Serjt.-Maj.) W. J.; Barnes, No. 14299 Serjt. W. McC.; Bates, No. 274 Flt. Serjt. (Actg. Serjt.-Maj.) G.; Beardsell, No. 1667 Flt. Serjt. A. E.; Bellairs, No. 2220 Flt. Serjt. J.; Black, No. 1894 Flt. Serjt. D.; Blake, No. 24107 Flt. Serjt. G. G. L.; Brown, No. 7969 Qr.-Mr.-Serjt. W. J.; Butt, No. 91 Flt. Serjt. (actg. Serjt.-Maj.) W. H.; Bywater, No. 3581 Cpl. R.; Camfield, No. 3804 Flt. Serjt. J. F.; Collins, No. 16320 Cpl. T.; Cottingham, No. 3232 Cpl. H. E.; Cryer, No. 3835 Flt. Serjt. S. E.; Davies, No. 26178 Flt. Serjt. D.; Davin, No. 61912 2nd Cl. Air Mech. F. G.; Dawson, No. 15896 Flt. Serjt. J. D.; Farrow, No. 5403 Flt. Serjt. S.; Felton, No. 15917 Flt. Serjt. B. W.; Fitzgerald, No. 1705 Flt. Serjt. (actg. Serjt.-Maj.) M. B.; Freed, No. 4108 Serjt. A. H.; Gee, No. 1187 Flt. Serjt. A. H.; Gibson, No. 5098 Flt. Serjt. W. S.; Harries, No. 1334 Flt. Serjt. G. B.; Henderson, No. 15888 Serjt. J.; James, No. 20236 Flt. Serjt. C. W.; Jenkins, No. 7521 Cpl. W. A.; Jones, No. 9399 Cpl. M.; Lawrie, No. 3702 Flt. Serjt. J. A.; Lowe, No. 32257 1st Cl. Air Mech. H. E.; Nethy, No. 104 Flt. Serjt. (actg. Staff Serjt.-Maj.) A. F.; Payne, No. 17062 Flt. Serjt. (actg. Serjt. Maj.) H. J.; Perrin, No. 13091 Flt. Serjt. C. H.; Pinder, No. 11597 Serjt. W. J.; Rogers, No. 18319 Serjt. S. C.; Ross, No. 8254 1st Cl. Air Mech. J.; Rossi, No. 17122 Serjt. B. P.; Sanders, No. 6300 Flt. Serjt. E.; Sharpe, No. 5127 Flt. Serjt. (actg. Serjt.-Maj.) W. T.; Simpson, No. 436 Flt. Serjt. (actg. Serjt.-Maj.) A. H.; Skeggs, No. 2706 Flt. Serjt. (actg. Serjt.-Maj.) A. W.; Smallbones, No. 9572 Cpl. A.; Starling, No. 12377 Serjt. H. S.; Stevenson, No. 4003 Flt. Serjt. T.; Stone, No. 2048 Flt. Serjt. F.; Taylor, No. 12268 Cpl. R.; Turner, No. 128 Flt. Serjt. (actg. Serjt.-Maj.) W. G.; Webber, No. 2359 Flt. Serjt. W.

June 1st.

The following names are among those mentioned in the last Supplement containing Sir Douglas Haig's dispatch of April 9th, submitting names deserving of special mention.

Grattan-Bellew, Maj. W. A., M.C., Conn. Rang. and R.F.C. (died of wounds).

Graves, Maj. E. P., R.A. and R.F.C. (killed).

Harvey-Kelly, Maj. H. D., D.S.O., R. Ir. R. and R.F.C.

Leighton, Maj. J. B. T., M.C., S. Gds. and R.F.C. (died of wounds).

Magawly, Cerati de Calry, Capt. (temp. Lt.-Col.) V. A., D.S.O., R.F.C., and Dns. (killed).

Pashley, Sec. Lt. E. C., R.F.C., Spec. Res. (killed).

July 4th.

General Murray's dispatch, covering operations in Egypt from Oct. 1st, 1916, to Feb. 28th, 1917:—

STAFF.—Salmond, Bt. Lt.-Col. (temp. Brig. Gen.) W. G. H., R.A. and R.F.C.

ROYAL FLYING CORPS.—Bannatyne, Lt. (temp. Maj.) E. J. Burchall, Capt. (temp. Maj. in Army) H., R.F.C. (Spec. Res.); Freeman, Capt. R. H., Worc. R.; Guilloyle, temp. Capt. W. J. Y.; Kingsley, temp. Lt. S. G., Gen. List; Muir, temp. Capt. S. K.; Bradwell, 3206 Flt. Serjt. W. A.

AUSTRALIAN IMPERIAL FORCE.—AUSTRALIAN FLYING CORPS.—Jones, Capt. A. M.; Sheldon, Capt. W.; Wackett, Lt. L. J.; Gibbs, 156 Flt. Serjt. E. A., 67th Squad; Murphy, War. Officer A. W., 67th Squad.

July 17th.

No. 25501 1st Cl. Air Mech. James Oliver Jessop, R.F.C. (killed in action).

July 18th.

Lt.-Gen. G. F. Milne's dispatch from Salonika, dated March 26th:—

Dawes, Maj. (temp. Lt.-Col.) G. W. P., D.S.O., R. Berks. R.; Cleghorn, Lt. (temp. Maj.) A., R.E.; Wise, Lt. (temp. Capt.) C. W., A.S.C., Spec. Res.; Gardner, Lt. (temp. Capt.) G. D., York. R.; Birch, Sec. Lt. (temp. Capt.) W. L., W. York R.; Nevill, Sec. Lt. (temp. Capt.) S. S., Spec. Res.; Scott, Lt. W. S., M.C., Lan. Fus.; Saunders, temp. Lt. F. G., Gen. List; Wilson, temp. Lt. J. R., R.E.; Leigh, Sec. Lt. (temp. Lt.) J. W. D., Cyc. Bn.; Scholtz, Sec. Lt. H., R.F.A., Spec. Res.; Broadway, Sec. Lt. J. H., Dorset R.; Bamford, temp. Sec. Lt. J. L., Gen. List.

Tansley, No. 740 Flt. Serjt. R. J. C. (decd.); Alcock, No. 2832 Serjt. A.; Yates, No. 2454 Cpl. T. M.; Wood, No. 28309 1st Cl. Air Mech. W. T.; Ledger, No. 8073 1st Cl. Air Mech. W. H.; Parkhurst, No. 3745 1st Cl. Air Mech. W. E.; Wolfe, No. 2372 1st Cl. Air Mech. W.

July 27th.

Brought to the notice of the Secretary of State for War for distinguished services rendered in connection with the war:—

Livingston, Maj. (temp. Lt.-Col.) G., C.M.G., Lond. R. and R.F.C.

Salmond, Maj. and Bt. Lt.-Col. (temp. Brig.-Gen.) J. M., C.M.G., D.S.O., R. Lanc. R. and R.F.C.

Valentine, Capt. (temp. Maj.) J., R.F.C., Spec. Res.

Aug. 7th.

Brought to the notice of the Secretary of State for War for distinguished services rendered in connection with the war:—

Fletcher, Qrmr. and Hon. Lt. (temp. Lt.-Col.) A., M.C., R.F.C.

Pryce, Qrmr. and Hon. Lt. (temp. Maj.) W. J. D., R.F.C.

Aug. 15th.

Dispatch from Lt.-Gen. Sir Stanley Maude, C.-in-C. Mesopotamia:—

Bayly, Lt. (temp. Capt.) L. J., R.A.; de Havilland, Capt. (temp. Maj. in Army) H., D.S.O., R.F.C., Spec. Res.; Forsyth, Sec. Lt. (temp. Lt.) W. A., R.A.; Hawker, Lt. T. McD., R. Ir. Fus.; Herring, Lt. (temp. Maj. in Army) J. H., D.S.O., M.C., R.F.C., Spec. Res.; Macfarlane, Sec. Lt. R. M. C., R.A.; Merton, Lt. (temp. Capt. in Army) G., M.C., R.F.C., Spec. Res.; Moxey, Temp. Lt. E. R.; Rattray, Temp. Lt. A. R.; Tennant, Bt. Maj. (temp. Lt.-Col.) J. E., M.C., S. Gds.; Tullis, Temp. Lt. (temp. Capt.) W. W., Gen. List.

Ayling, No. 11687 (local Serjt.) S. B., Wilts R. (now No. 78877, R.F.C.); Coates, No. 1676 Flt. Serjt. W. A. H.; Deacon, No. 77481 Cpl. H.; Evans, No. 3983 Serjt. P. W.; Gardner, No. 14170 Cpl. G.; Keil, No. 5551 1st Air Mech. F.; Vaile, No. 1651 Flt. Serjt. A.; Walton, No. 4161 Serjt. F.

Sept. 17th.

## OPERATIONS IN EGYPT.

## ROYAL FLYING CORPS.

Floyer, Lt. E. A., I.A.R.O. and R.F.C.; Henderson, Lt. T., R.E. and R.F.C.; Leeson, Sec. Lt. B. E., Ches. R. and R.F.C.; Ross, Maj. A. J., D.S.O., R.E. and R.F.C.; Siddons, Sec. Lt. V. D., Northn. R. and R.F.C.; Stafford, Sec. Lt. W. G., Gen. List; Stent, Lt. (temp. Capt. in Army) F. W., R.F.C. (Spec. Res.); Thomson, Sec. Lt. (temp. Lt.) D. N., Yeo. and R.F.C.; Catchpole, No. 6737 Cpl. C. J.; Colwill, No. 1859 Cpl. R.; Gibson, No. 1753 Flt. Serjt. G. A. F.; Pound, No. 3030 1st Cl. Air Mech. F.; Teasdale, No. 10933 Cpl. C. E.; Warr, No. 5986 1st Cl. Air Mech. C. J.; Wilder, No. 8268 1st Cl. Air Mech. J. F.; Wright, No. 2507 Serjt. H. H.

Oct. 31st.

Dispatch from Sir Charles Monro, C.-in-C. India, operations on North-West Frontier:—

R.F.C.—Bradley, Maj. C. R. S.

Services in Egypt:—

Bt. Lt.-Col. (temp. Brig.-Gen.) W. G. H. Salmond, D.S.O.

Nov. 3rd.

Dispatch, dated Oct. 25th, 1917, from Lt.-Gen. G. F. Milne, C.B., D.S.O., C.-in-C., British Salonika force:—

Nov. 28th.

## ROYAL NAVAL AIR SERVICE.

Boynton, Flt. Lt. E. S.; Bradley, Flt. Lt. E. T.; Hicks, Flt. Lt. E. P.; Magor, Flt. Lt. G. A.; Moore, Flt. Lt. G.; Richardson, Flt. Sub-Lt. W. H.; Scarlett, Capt. F. R., R.N. (Wing Capt., R.N.A.S.); Smyth Pigot, Wing Comdr. J. R. W., D.S.O.

## ROYAL FLYING CORPS.

Bamford, temp. Lt. J. L., Gen. List (killed); Bell, Lt. (temp. Capt.) W. D. M., M.C., Spec. Res.; Easdale, Lt. D., Spec. Res.; Edmunds, Lt. P. M. L., Lrs.; Gibson, Lt. H. J., Spec. Res.; Goulding, Lt. A. G., M.C., Can. Infy.; Green, temp. Lt. (temp. Capt.) G. W. M., D.S.O., M.C., Gen. List; Herring, Lt. (temp. Maj.) J. H., D.S.O., M.C., Spec. Res.; Knight, Lt. A., N. Lan. R.; McBain, Lt. (temp. Capt.) W. R. B., R.F.A.; McLean, Lt. (temp. Capt.) J. Y., R.F.C.; Meller, temp. Sec. Lt. (temp. Capt.) S. A., Gen. List; Minchin, Lt. (temp. Maj.) F. F., M.C., Spec. Res.; Preston, Capt. O. I., Notts and Derby R.; Scales, temp. Lt. H. J., Gen. List; Songhurst, Lt. (temp. Capt.) F. H., Spec. Res.; Sutherland, temp. Sec. Lt. (temp. Lt.) W., Gen. List; Wynne-Eyton, temp. Lt. R. M., Gen. List; Airey, No. 5755 Flt. Sjt. J. W.; Andrews, No. 7876 1st Cl. Air Mech. W. H. S.; Frith, No. 36764 Cpl. H.; Holding, No. 2371 Sjt. W. C.; Lovelace, No. 2468 Sjt. F.; Ward, No. 25268 Cpl. J. A.; Young, No. 25407 Cpl. J. L.

Dec. 11th.

Mentioned by Sir Douglas Haig for gallant services and devotion to duty during the period from Feb. 26th to Sept. 20th.

## THE ROYAL NAVY.

Chambers, Wing Comdr. E. T. R., R.N.; Collishaw, Actg. Flt. Comdr. R., D.S.O., D.S.C.; Dallas, Sqdn. Comdr. R. S., D.S.C.; Halahan, Wing Capt. F. C., M.V.O., R.N.; Jenner-Parson, Flt. Lt. C. H. B.; Little, Actg. Flt. Comdr. R. A., D.S.O., D.S.C.; McNeil, Flt. Sub-Lt. P. G. (killed); Malone, Flt. Sub-Lt. J. J., D.S.O. (killed).

## STAFF.

Becke, Temp. Brig.-Gen. J. H. W., D.S.O., Notts and Derby Regt.

Corballis, Capt. E. R. L., R. Dub. Fus. and R.F.C.

Davidson, Temp. Lt.-Col. E. H., M.C., Gord. Highrs. and R.F.C.

Higgins, Temp. Brig.-Gen. J. F. A., D.S.O., R.A.



# Auster

PATENT  
(1914) LTD.

Patentees and Sole Manufacturers

OF THE

## AUSTER - TRIPLEX AERO WINDSHIELDS

FOR EVERY TYPE OF MACHINE

MANUFACTURERS OF

Eye Bolts	Steel Stampings	Castings in Aluminium
Cup Sockets	Steel Pressings	Brass, etc.
Patent Release Catches	Brass Fittings	Non-Flam Windshields
Foot Pads & A.G.S. Parts		Canvas Windshields

### AUSTER (1914) LTD.

LONDON: 133, Long Acre, W.C. 2

Telephone: REGENT 5910.

Telegrams: "WINFLECTOR, 'PHONE."

BIRMINGHAM: Crown Works, Barford Street

Telephone: MIDLAND 2123.

Telegrams: "AUSTER, BIRMINGHAM."

The Hollow Structure and Aircraft Co., Ltd., Patent.

## WOOD PROBLEM SOLVED.

# HOLLOW SPARS

And Struts for all types of machines.

Any length, shape or section without joints.

FULL PARTICULARS FROM

ROBERT YOUNG'S CONSTRUCTION CO., LTD.,

AIRCRAFT CONTRACTORS,

CANONBURY WORKS, ESSEX ROAD, LONDON, N.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

## THE HONOURS LIST OF R.F.C. IN 1917.

## Mentioned in Dispatches (continued).

Longcroft, Temp. Brig.-Gen. C. A. H., Welsh Regt.  
 MacInnes, Bt. Lt.-Col. (actg. Lt.-Col.) D. S., C.M.G., D.S.O.,  
 Shephard, Bt. Maj. (temp. Brig.-Gen.) G. S., D.S.O., M.C.,  
 R. Fus.  
 Trenchard, Maj.-Gen. H. M., C.B., D.S.O.  
 Webb-Bowen, Bt. Lt.-Col. (temp. Brig.-Gen.) T. J., Bedf. R.

## ROYAL FLYING CORPS.

Adams, Temp. Maj. A. B., Spec. Res.; Allcock, Temp. Capt.  
 W. T. L., Spec. Res. (killed); Andrews, Temp. Capt. J. O.,  
 D.S.O., M.C., R. Scot.  
 Baldwin, Temp. Maj. J. E. A., Hrs.; Barber, Temp. Capt.  
 B. K. B., North'd. Fus.; Barlow, Temp. Sec. Lt. J. L., Gen.  
 List (killed); Barnaby, Temp. Capt. H. O., R.F.A.; Barton,  
 Capt. R. J. F., R. Sc. Fus.; Beale, Temp. Capt. C. O. B., D.S.O.,  
 Gen. List; Bettington, Temp. Capt. E. M., Gen. List; Bird,  
 Temp. Capt. A. W., D.S.O., Gen. List; Birley, Temp. Maj.  
 J. L., M.B., R.A.M.C.; Bishop, Temp. Maj. W. A., V.C.,  
 D.S.O., M.C., Can. Cav.; Blomfield, Temp. Maj. R. G., Yeo  
 (Sec. Lt., D. Gds.); Blount, Temp. Maj. C. H. B., M.C., R.W.  
 Surr. R.; Boustead, Lt. H. A. R., Middx. R. (died of wounds);  
 Bruce-Clarke, Capt. W. R., Lond. R.; Bryant, Temp. Maj.  
 C. E., D.S.O., Hrs.; Burnett, Lt. T. L. F., Spec. Res.; Byng,  
 Temp. Lt.-Col. Hon. A. S., Gen. List.

Campbell, Temp. Maj. W. C., D.S.O., M.C., Spec. Res.;  
 Carthew, Temp. Lt.-Col. T. W. C., D.S.O., Gen. List; Charles,  
 Temp. Lt. H. N., Gen. List; Christie, Temp. Lt.-Col. A. R.A.;  
 Cleghorn, Temp. Capt. D. B., Gen. List; Collier, Temp. Lt.-Col.  
 R. H., Spec. Res.; Coningham, Temp. Capt. A., D.S.O., M.C.,  
 Spec. Res.; Crang, Sec. Lt. J. G., Spec. Res.

D'Arcy, Sec. Lt. S. H. A., D.S.O., Spec. Res.; Dashwood,  
 Capt. S. L., R.E.; Dixon, Temp. Capt. F. C., Dorset R.; Dore,  
 Maj. A. S. W., Worc. R.; Down, Lt. C. M., Herts R.; Dunlop,  
 Temp. Capt. C., Sea. Highrs.

Freeman, Temp. Lt.-Col. W. R., D.S.O., M.C., Manch. R.;  
 Fullard, Temp. Capt. P. F., D.S.O., M.C., Gen. List.

Gordon, Capt. C. F., M.C., N. Staff. R.; Gordon, Temp. Lt.  
 T. G., Gen. List; Gossage, Temp. Maj. E. L., M.C., R.F.A.;  
 Gouldstone, Temp. Lt. W. H., Gen. List; Graham, Lt. E.,  
 Spec. Res.; Greenwell, Lt. R. A., R.F.A.; Grenfell, Temp. Maj.  
 G. P., Spec. Res.

Harding, Temp. Lt. S. A., Spec. Res. (died of wounds);  
 Hearson, Temp. Lt.-Col. J. G., D.S.O., R.E.; Heath, Temp.  
 Lt. R. E., Welsh R.; Henderson, Temp. Maj. G. L. P., M.C.,  
 Spec. Res.; Higman, Temp. Capt. H. P. L., R.E.; Holliday,  
 Temp. Capt. F. P., D.S.O., M.C.; Holt, Temp. Lt.-Col.  
 V., D.S.O., Oxf. and Bucks. L.I.; Hope, Capt. A. H. C.,  
 Sea. Highrs.; Hunter, Temp. Maj. H. J. F., M.C., Rif. Brig.

Jenkins, Maj. L., M.C., R.G.A.; Jupp, Temp. Capt. W. D. L.,  
 Spec. Res.

Kemper, Temp. Capt. L. S., Lan. R.; Kennedy-Cochran-  
 Patrick, Temp. Maj. W. J. C., D.S.O., M.C., Rif. Brig.; Kin-  
 near, Temp. Maj. J. L., M.C., L'pool. R.

Learmount, Temp. Maj. L. W., D.S.O., M.C., Spec. Res.;  
 Leech, Temp. Sec. Lt. W. F., D.S.O. (died of wounds);  
 Leighton, Temp. Maj. J. B. T., M.C., S. Gds. (died of wounds);  
 Levick, Temp. Maj. A.; Lowcock, Temp. Capt. R. J., D.S.O.,  
 M.C., Notts and Derby R.; Ludlow-Hewitt, Temp. Lt.-Col.  
 E. R., M.C., R. Ir. Rif.

Maddock, Temp. Sec. Lt. J. W., Gen. List; Mansfield, Temp.  
 Lt.-Col. W. H. C., D.S.O., Shrop. L.I.; Marson, Temp. T. B.,  
 Yeo.; Martyn, Capt. C. G., Mon. R.; M'Coy, Temp. Capt.  
 R. P. J., Spec. Res.; Middlemas, Temp. Capt. P., Gen. List;  
 Mitchell, Temp. Maj. G. A. N., R. Fus.; Mitchell, Temp.  
 Lt.-Col. W. G. S., M.C., High. L.I.; Morris, Temp. Maj. A. S.,  
 Gen. List.

Newall, Temp. Lt.-Col. C. L. N., Ind. Army.  
 Palmer, Temp. Capt. E. B., A.S.C.; Patten, Temp. Lt.  
 I. McD., Spec. Res. (killed); Pither, Temp. Capt. S. E., K.O.  
 Sco. Bord.; Portal, Temp. Maj. C. F. A., D.S.O., M.C., R.E.,  
 Spec. Res.; Powell, Temp. Capt. E., Spec. Res.; Pretzman,  
 Temp. Lt.-Col. G. F., D.S.O., Somerset L.I.; Probyn, Temp.  
 Capt. H. M., D.S.O., R. War. R.; Pullan, Temp. Lt. J. A.,  
 Durh. L.I., Spec. Res.

Rawson, Temp. Sec. Lt. A. H. C. A., R. War. R.; Rhys-  
 Davids, Lt. A. P. F., D.S.O., M.C., Spec. Res.; Robertson,  
 Temp. Maj. T. E., Spec. Res.; Roxby, Temp. Maj. F. M.,  
 N. Staffs. R.

Scott-Davison, Temp. Lt. W. W., Gen. List; Sharp, Temp.  
 Capt. C. C., Gen. List; Sharples, Temp. Sec. Lt. N., Manch. R.;  
 Shephard, Temp. Capt. A. S., D.S.O., M.C., Spec. Res. (Sec.  
 Lt. C'wealth. Mil. Forces); Shepherd, Temp. Lt. C. K., Gen.  
 List; Snow, Temp. Maj. W. R., M.C., Spec. Res.; Starling,  
 Temp. Maj. J.; Sutton, Temp. Capt. B. E., D.S.O., M.C., Spec.  
 Res., Yeo.

Turner, Temp. Capt. N., Spec. Res.; Tyson, Temp. Maj. E. J.,  
 D.S.O., M.C., Gen. List.

Van Ryneveld, Temp. Maj. H. A., M.C., Gen. List; Vinson,  
 Temp. Capt. A. H., Spec. Res.

Waker, Temp. Maj. A. A., M.C., Lond. R.; Warman, Temp.

Sec. Lt. C. T., D.S.O., M.C., Gen. List; Wilkinson, Temp.  
 Maj. A. M., D.S.O., Hamps. R.; Woodhouse, Capt. J. W.,  
 D.S.O., M.C., Spec. Res.; Wynne-Eyton, Temp. Maj. C. S.,  
 Gen. List.

## ANTI-AIRCRAFT SERVICES.

Dec. 20th.

The names of the following have been brought to notice in dis-  
 patches for valuable services rendered in connection with Anti-  
 Aircraft Services in the United Kingdom:—

Ashmore, Bt.-Col. (temp. Maj.-Gen.) E. B., C.M.G., M.V.O.,  
 R.A.

Banks, Sec. Lt. C. C., R.W. Fus. and R.F.C.; Barra-  
 clough, Capt. E., R.G.A.; Bell, Sec. Lt. (temp. Capt.) D. J.,  
 M.C., R.F.C., Spec. Res.; Bishop, Sec. Lt. S., R.G.A., Spec.  
 Res.; Boreham, temp. Lt. (actg. Capt.) G. H., R.G.A.; Brand,  
 Lt. (temp. Capt.) C. J. G., M.C., R.F.C., Spec. Res.; Breeds,  
 Lt. A. H., R.G.A., Spec. Res.; Brittain Lt. (actg. Maj.) W. B.,  
 R.G.A.; Buckle, Capt. (actg. Lt.-Col.) C., R.G.A.

Chabot, Lt. C. J., R.F.C., Spec. Res.

Dittman, Capt. (actg. Lt.-Col.) W. E., R.G.A.

Fooks, Lt. (temp. Capt.) P. E. B., R.G.A.

Goldsmith, Maj. E. J., R.G.A.; Green, Temp. Capt. G. W. M.,  
 D.S.O., M.C., Gen. List and R.F.C.; Gregory, Maj. (temp. Lt.-  
 Col.), G. M. A., R.F.A.

Hankey, Maj. (temp. Lt.-Col.) Y. C. G. A., R.F.A., R. of O.  
 Hardy, Lt. (actg. Capt.) H. L., R.G.A.; Hargrave, Capt. (temp.  
 Maj.) W. B., Suff. R. and R.F.C.; Harrison, Sec. Lt. G. H.,  
 Midd'x R. and R.F.C.; Haynes, Temp. Capt. W. H., R.F.C.;  
 Hedges, Temp. Capt. (temp. Lt.-Col.) F. R., Gen. List and  
 R.F.C.; Hinton, Lt. (actg. Capt.) W. H., R.F.A.

Lucas, Maj. (actg. Lt.-Col.) W. G., R.G.A.

Mather, Capt. W. H., R.E.; Moore, Lt. (temp. Capt.) R. C.,  
 R.G.A.

Newton, Lt. H. A., R.G.A.; Nicholson, Temp. Sec. Lt. M.,  
 R.F.C.

Orr, Capt. F. G., R.F.A.

Pratt, Sec. Lt. (temp. Capt.) S., R. Fus., Spec. Res. and  
 R.F.C.

Rawlinson, Lt.-Col. A., C.M.G., R.G.A.; Ridley, Lt. (temp.  
 Capt.) C. A., D.S.O., M.C., R. Fus. and R.F.C.

Sutton, Lt. (temp. Capt.) C., R.F.C., Spec. Res.

Thompson, Lt.-Col. W. M., R.E.; Thomson, Capt. (temp.  
 Maj.) A. A. B., M.C., R. War. R. and R.F.C.

Watson, Capt. (temp. Lt.-Col.) A. T., R.F.C., Spec. Res.;  
 White, Maj. (actg. Lt.-Col.) Sir A. W., Bt., R.H.A.

Anness, No. 562665 Lt.-Cpl. (actg. Staff Serjt. Mech.) E. G.,  
 R.E.; Archer No. 65434 Serjt. W. E., R.G.A.; Arthur, No.  
 277960 Serjt. A., R.G.A.; Askew, No. 119348 Actg. Serjt. H. E.,  
 R.G.A.

Baker, No. 873 Flt. Serjt. R., R.F.C.; Baldwin, No. 168392 Cpl.  
 M., R.G.A.; Ballard, No. 145949 Actg. Bty. Qrmr.-Serjt. A. H.,  
 R.G.A.; Barber, No. 119199 Gnr. W. P., R.G.A.; Beaumont,  
 No. 132110 Actg. Bombr. B. T., R.G.A.; Beavis, No. 121940  
 Gnr. (actg. Serjt.) F. H., R.G.A.; Beecham, No. 149103 Cpl.  
 (actg. Serjt.) T. R., R.G.A.; Birchall, No. 562637 Cpl. (actg.  
 Serjt.) S., R.E.; Blackman, No. 128503 Cpl. (actg. Serjt.) J. H.,  
 R.G.A.; Brand, No. 465401 Mech. Staff-Serjt. T. M., R.E.;  
 Breething, No. 540443 Serjt. H. E., R.E.; Buckle, No. 23308  
 Serjt. C. H., R.F.C.; Bushbridge, No. 157729 Actg. Serjt. J. A.,  
 R.G.A.; Bush, No. 530076 Cpl. (actg. Staff Serjt.) T. W. C.,  
 R.E.

Calder, No. 8397 Temp. Serjt.-Maj. P. M., R.F.C.; Carpenter,  
 No. 540079 2nd Cpl. (actg. Serjt.) A., R.E.; Clay, No. 118834  
 Serjt. W., R.G.A.; Cormack, No. 683 Temp. Serjt.-Maj. W. D.,  
 R.F.C.

Davies, No. 92764 Actg. Serjt. A. F., R.G.A.; Day, No. 70018  
 Gnr. R. J., R.G.A.; Dodd, No. 27663 Serjt. C. F., R.G.A.;  
 Easdown, No. 128470 Actg. Bombr. H., R.G.A.; Eccles, No.  
 562876 Lt.-Cpl. (actg. Serjt.) P. J., R.E.

Fisher, No. 562507 Cpl. (actg. Serjt.) H. V., R.E.; Flood, No.  
 121665 Co. Qrmr.-Serjt. S. E., R.G.A.; Forrest, No. 11744 Flt.  
 Serjt. A. F. J., R.F.C.

Gard, No. 521108, Actg. Serjt. A., R.G.A.; Gilbert, No. 118402  
 Cpl. (actg. Serjt.) B., R.G.A.; Goodwin, No. 110213 Actg.  
 Bombr. F., R.G.A.

Hadley, No. 564128 Staff Serjt. (Mech.) C. A., R.E.; Hatfield,  
 No. 119362 Gnr. W. E., R.G.A.; Hattersley, No. 562640 2nd  
 Cpl. (actg. Staff Serjt.) (Mech.) A. W., R.E.; Hincks, No.  
 148208 Actg. Bty. Qrmr.-Serjt. G. W., R.G.A.; Hitchmough, No.  
 540090 Serjt. (actg. Staff Serjt.) W., R.E.; Horsley, No. 66805  
 Serjt. W., R.G.A.; Houghton, No. 121676 Actg. Serjt. W. P.,  
 R.G.A.; Howe, No. 66043 Cpl. (actg. Serjt.) W., R.G.A.; Howe,  
 No. 21420 Actg. Co. Qrmr.-Serjt. W. R., R.G.A.; Howell, No.  
 140205 Gnr. E. J. W., R.G.A.; Hulme, No. 126053 Gnr. W.,  
 R.G.A.; Hutton, No. 1775 Temp. Serjt.-Maj. A. E., R.F.C.

Locelyn, No. 562452 Serjt. (actg. Staff Serjt.) (Mech.) W. C. J.,  
 R.E.

King, No. 562124 Co. Qrmr.-Serjt. J. R., R.E.

Loise, No. 465276 Serjt. R. W., R.E.; Leigh, No. 121680 Cpl.



A PIONEER FIRM.

# HOPTON & SONS

(HOPTONS)

GEORGE STREET,  
EUSTON SQUARE,  
LONDON. N. W. 1.

&

UNION WORKS.  
MARKET HARBO'RO',  
LEICESTERSHIRE.

**SPECIALISE IN TIMBER AND BENT  
TIMBER PARTS, for AEROPLANES,  
SEAPLANES, AIRSHIPS, BALLOONS, and  
PARACHUTES.** ESTABLISHED 1840. Code: A.B.C. (5th Edn.)

Telegrams: "Hoptons, Eusquare, London."  
"Hoptons, Market Harboro'."

Telephones: MUSEUM 496.  
Mkt. Harboro' 13.

Are YOU interested in Flying?

IF SO,

Why are YOU not taking

**THE NOTTINGHAM FLYING AND  
CORRESPONDENCE SCHOOLS, Ltd.  
COURSE?**

**THE IMPERIAL FLYING SERVICE PILOTS  
SAY IT IS THE BEST IN THE COUNTRY.**

Write for Particulars and Illustrated Book issued Free.

**32, King Street, Nottingham.**

'Phone 5766.

## THE HONOURS LIST OF R.F.C. IN 1917.

## Mentioned in Dispatches (continued).

N. H., R.G.A.; Lemon, No. 502372 Serjt. (actg. Co. Qrmr-Serjt.) C. P., R.E.; Letley, No. 540978 Spr. (actg. Cpl.) J., R.E.; Light No. 152354 Actg. Bombr. I. A., R.G.A.  
 MacCarthy, No. 173730 Fitter Staff Serjt. M. J., R.G.A.; Maguire, No. 128861 Serjt. J., R.G.A.; Middleton, No. 562076 Serjt. (actg. Staff Serjt.) (Mech.) H., R.E.  
 Owen, No. 112228 Gnr. R., R.G.A.  
 Paine, No. 562118 L.-Cpl. (actg. Serjt.) E., R.E.; Palmer, No. 119252 Actg. Serjt. E., R.G.A.; Patmore, No. 563835 L.-Cpl. (actg. Cpl.) W., R.E.; Peck, No. 4758 Temp. Serjt.-Maj. G. F., R.F.C.; Pile, No. 127923 Actg. Serjt. F. J., R.G.A.; Preece, No. 15827 Gnr. (actg. Serjt.) W. A., R.G.A.  
 Rees, No. 128734 Actg. Bombr. R., R.G.A.; Richards, No. 279312 Serjt. W., R.G.A.; Rimmington, No. 284097 Bty. Serjt.-Maj. F. W., R.G.A.; Rose, No. 118857 Gnr. F. G., R.G.A.; Rowe, No. 321237 Actg. Serjt. J., R.G.A.  
 Shakespeare, No. 563557 Sec. Cpl. (actg. Cpl.) F., R.E.; Smith, No. 132593 Serjt. F., R.G.A.; Smith, No. 540030 Sec. Cpl. (actg. Serjt.) T. A., R.E.; Snook, No. SR/13 Temp. Serjt.-Maj. W. A. C., R.F.C.; Sullivan, No. 562339 Serjt. (actg. Co. Qrmr-Serjt.) E. H., R.E.  
 Talbot, No. 137673 Gnr. S., R.G.A.; Thorpe, No. 562233 Cpl. (actg. Staff Serjt.) (Mech.) W. R., R.E.; Trevenen, No. 138182 Serjt. E. W., R.G.A.; Tupper, No. 137606 Gnr. F., R.G.A.; Twiney, No. 61956 Actg. Co. Qrmr-Serjt. B. F., R.G.A.  
 Upcott, No. 352150 Serjt. S. F., R.G.A.  
 Williams, No. 127927 Actg. Serjt. R., R.G.A.; Williamson, No. 184385 Gnr. J. R., R.G.A.; Winny, No. 119288 Actg. Bombr. E. A., R.G.A.; Woodford, No. 119292 Actg. Cpl. G. W., R.G.A.; Woodford, No. 21148 Actg. Qrmr-Serjt. F., R.G.A.; Woodyard, No. 530008 Serjt. (actg. Co. Qrmr-Serjt.) J. A., R.E.  
 Yull, No. 530019 Cpl. (actg. Staff Serjt.) G. A., R.E.

Dec. 21st.

The names of the following have been brought to the notice of the Secretary of State for War for valuable services rendered in connection with anti-aircraft service in the United Kingdom, and, when applicable, an entry will be made in the records of service of officers and other ranks:—

Arnold, Sec. Lt. (actg. Lt.) A. F., R.G.A. (Spec. Res.); Arnott, Lt. (actg. Maj.) E. W., R.F.A.  
 Bennett, Capt. (temp. Maj.) L. M., R.F.C. (Spec. Res.); Brown, Lt. C. N., R.G.A.  
 Campbell, Capt. (actg. Maj.) C. M., A.M.I.E.E., R.E.; Coe, Lt. (temp. Capt.) C. G., R.F.C. (Spec. Res.); Corbet, Capt. (temp. Maj.) B. D'A., Res. of Officers, Gds.; Courtney, Lt. (temp. Capt.) R. A., R.F.C. (Spec. Res.); Cousin, Capt. (actg. Maj.) A. J., R.F.A.; Cox, Lt. (actg. Capt.) H. B., R.G.A.; Crane, Temp. Capt. L. F., N. Lan. R.  
 Daw, Temp. Lt. G. C., R.F.A.; Death, Sec. Lt. (temp. Lt.) T., R.F.A.; Dunn, Temp. Lt. W. A., R.F.C.  
 Ellison, Lt. (actg. Capt.) T. F., R.G.A.  
 Gay, Capt. L. H., S. Lan. R. (Spec. Res.); Mackenzie-Grieve, Maj. (actg. Lt.-Col.) J. A., R.A.; Gordon, Lt. L. C., R.G.A.  
 Halahan, Capt. (temp. Lt.-Col.) J. C., Res. of Officers, R. Dub. Fus. and R.F.C.; Hamlett, Lt. (temp. Maj.) H. W., R.F.A.; Harvey, Lt.-Col. J., D.S.O., R.F.C.; Herring, Lt. (actg. Capt.) F. W. M., R.E.; Howell, Sec. Lt. (temp. Lt.) A., R.E.; Hutchison, Lt.-Col. R. L., T.D., R.E.; Hunter, Temp. Lt. (actg. Capt.) W. A., Gen. Staff, Gen. List; Hunter, Maj. (actg. Lt.-Col.) D. H. K., R.F.A.  
 James, Lt. (temp. Capt.) W. H., R.E.; Jones, Maj. A. H., R.E.  
 Kennedy, Lt. (temp. Capt.) R. L., Hrs. and R.F.C.; King, Sec. Lt. G. O., R.E.  
 Langham, Temp. Lt. (temp. Capt.) C. A., R.F.A.; Lewis, Lt. O. W. H., R.G.A.  
 Mackay, Sec. Lt. (temp. Capt.) J. I., W. Rid. R. and R.F.C. (killed); Martin, Maj. A. R., T.F. Res. and R.F.C.; Millard, Capt. B. S., R.E.; Mitchell, Lt. W. A. P., R.G.A.; Molony, Lt.-Col. T. C. W., D.S.O., R.F.A.; Morgan, Temp. Maj. R. E. H., R.D.C., late R.A.  
 Nishit, Lt. W. B., R.G.A.  
 Philips, Temp. Capt. C. C., R.G.A.  
 Reader, Capt. (actg. Maj.) H. C., R.G.A.; Reid, Capt. (temp. Lt.-Col.) J. W., R.F.A., Res. of Officers; Roxby, Capt. (temp. Maj.), F. M., N. Staffs R. and R.F.C.  
 Schofield, Temp. Lt. H. U., R.G.A.  
 Thomson, Temp. Capt. G., R.G.A.  
 Whitfield, Capt. F. E. B., Welsh R. (Spec. Res.) and R.F.C.; Whittaker, Lt. (temp. Capt.) W. E. de B., L'pool R.; Williams, Sec. Lt. (actg. Lt.) H. H., R.G.A. (Spec. Res.); Wyncoll, Capt. H. E. F., M.C., Notts and Derby R. and R.F.C.

Alexander, No. 530075 Serjt. R. S., R.E.; Anderson, No. 127615 Gnr. A., R.G.A.; Andrews, No. 12081 Cpl. A. G., R.G.A.; Ashenden, No. 128597 Serjt. J. T., R.G.A.  
 Baker, No. 873 Serjt. (Flt. Serjt.) R., R.F.C.; Baker, No.

358453 Actg. Bombr. S. H., R.G.A.; Becton, No. 65434 Actg. Qrmr-Serjt. B., R.G.A.; Beddall, No. 530035 Serjt. A., R.E.; Bennett, No. 262719 Actg. Serjt. G. W., R.G.A.; Bicknell, No. 5011 Serjt. (Flt. Serjt.) G. H. R.F.C.; Black, No. 92746 Actg. Serjt. A. McG., R.G.A.; Blake, No. 61992 Serjt. (actg. Co. Serjt.-Maj.) W., R.G.A.; Blanchard, No. 103013 1st Air Mech. (actg. Cpl.) G., R.F.C.; Bode, No. 132184 Gnr. S., R.G.A.; Bodkin, No. 122284 Gnr. H., R.G.A.; Bold, No. 530105 Spr. C. A., R.E.; Boss, No. 101155 Cpl. (actg. Serjt.) J. W., R.G.A.; Brown, No. 350 Serjt. R., R.G.A.; Burgess, No. 16567 Gnr. F., R.G.A.; Burrow, No. 563408 Actg. Serjt. W. H., R.E.; Bush, No. 562365 Actg. Cpl. J. T., R.E.

Care, No. 697 Serjt. A. H., R.F.C.; Chandler, No. 147991 Cpl. (actg. Serjt.) C. H., R.G.A.; Cooley, No. 96458 Actg. Serjt. A. J., R.G.A.; Cox, No. 118836 Co. Qrmr-Serjt. A. E., R.G.A.; Crick, No. 90354 Cpl. A. A., R.G.A.; Cross, No. 119227 Actg. Serjt. W. H., R.G.A.; Crowe, No. 4199 Serjt. G., R.G.A.

Davidson, No. 92768 Gnr. C., R.G.A.; Davies, No. 142478 Serjt. J., R.G.A.; Davies, No. 126256 Gnr. A. J., R.G.A.; Davies, No. 119294 Actg. Full Bombr. L., R.G.A.; Derbyshire, No. 118716 Actg. Cpl. J., R.G.A.; Dixon, No. 125451 Serjt. A. J., R.G.A.; Donegan, No. 53052 Pte. (actg. Regtl. Qrmr-Serjt.) M. W., R.D.C.; Downer, No. 119222 Serjt. E., R.G.A.

Edwards, No. 10361 Serjt. (Flt. Serjt.) J., R.F.C.; Emerson, No. 562495 Actg. Serjt. B. C., R.E.; Emmerson, No. 50881 L.-Cpl. (actg. Co. Qrmr-Serjt.) W. H., R.D.C.; Eves, No. 6255 Serjt. (Flt. Serjt.) B. B., R.F.C.

Fagg, No. 562628 Actg. Staff Serjt. Mech. C. H., R.E.; Farrow, No. 8473 Cpl. F. S., R.F.C.; Fell, No. 465132 Staff Serjt. J., R.E.; Fenn, No. 149544 Actg. Serjt. A. J., R.G.A.; Fenn, No. 128865 Actg. Bombr. F. J., R.G.A.; Frizelle, No. 28287 Actg. Co. Qrmr-Serjt. T. J., R.G.A.

Gardiner, No. 90262 Serjt. W. H., R.G.A.; Green, No. 119232 Gnr. W. W., R.G.A.

Hale Hall, No. 122198 Serjt. R., R.G.A.; Halford, No. 358190 Gnr. H. E., R.G.A.; Harman, No. 2693 Serjt. (Flt. Serjt.) F. H. L., R.F.C.; Harris, No. 136946 Actg. Bombr. A., R.G.A.; Harvey, No. 132611 Actg. 3rd Cl. Mr. Gnr. G., R.G.A.; Hayward, No. 518015 Actg. Co. Qrmr-Serjt. R., R.E.; Helliwell, No. 19892 Serjt. G., R.F.C.; Hick, No. 466182 Serjt. J., R.E.; Hill, No. 2060 Serjt. G. E., R.F.C.; Hill, No. 279772 Actg. Serjt. W., R.G.A.; Howe, No. 1773 Temp. Serjt.-Maj. V., R.F.C.; Hunt, No. 562361 Actg. Serjt. G. W., R.E.

Inns, No. 562590 Actg. Serjt. G. E., R.E.  
 Jacobs, No. 562260 Actg. Cpl. C. W., R.E.; James, No. 376444 Actg. Serjt. J. H., R.G.A.; James, No. 563129 Actg. Serjt. R. H., R.E.; Jennings, No. 5280 Serjt. (Flt. Serjt.) H., R.F.C.; Johnson, No. 2592 Serjt. (Flt. Serjt.) H. N., R.F.C.; Jolly, No. 284120 Serjt. A., R.G.A.; Jones, No. 145943 Actg. Serjt. G. B., R.G.A.

King, No. 119241 Actg. Serjt. C. D. W., R.G.A.; Knowles, No. 564063 Actg. 2nd Cpl. J. B., R.E.; Manning, No. 119371 Gnr. H., R.G.A.; Marrows, No. 530313 Cpl. C. D., R.E.; Mitchell, No. 10894 Serjt. A., R.F.C.; Monk, No. 174870 Actg. Bombr. A. E., R.G.A.; Muir, No. 18501 Serjt. R. W., R.F.C.

Newbolt, No. 562202 Actg. Serjt. F. W., R.E.; Nicholls, No. 1321 Serjt. (Flt. Serjt.) R., R.F.C.; Nixon, No. 92787 Actg. Cpl. J., R.G.A.

Padbury, No. 562139 Actg. Serjt. J., R.E.; Page, No. 168667 Serjt. T. J., R.G.A.; Palmer, No. 121554 Gnr. A., R.G.A.; Payne, No. 14006 Cpl. H., R.F.C.; Pearce, No. 530295 Serjt. W., R.E.; Pike, No. 3092 Serjt. (Flt. Serjt.) C. F., R.F.C.; Pringle, No. 94534 Gnr. P., R.G.A.

Ralph, No. T/22735 Pte. (actg. Staff Serjt.) (Mechanist) A. J., A.S.C. (M.T.); Robinson, No. 540541 Actg. Staff Serjt. F. A., R.E.; Rushworth, No. 118493 Cpl. S., R.G.A.

Salmon, No. 118828 Bombr. H. E., R.G.A.; Sanders, No. 143930 Actg. Serjt. S. G., R.G.A.; Schofield, No. 563888 Spr. W. H., R.E.; Shacklady, No. 563722 Actg. Cpl. A., R.E.; Shaw, No. 3065 Serjt. (Flt. Serjt.) G. W., R.F.C.; Shoter, No. 562602 Actg. Serjt. A. H., R.E.; Smith, No. 97651 Gnr. J., R.G.A.; Smith, No. 562505 Actg. Cpl. P. C., R.E.; Spall, No. 136779 Serjt. P. J., R.G.A.; Squires, No. 88661 Actg. Cpl. H. J., R.G.A.; Stead, No. 128736 Actg. Full Bombr. W. S., R.G.A.; Strachen, No. 562442 Actg. Co. Qrmr-Serjt. R. J., R.E.

Taylor, No. 128741 Serjt. F., R.G.A.; Taylor, No. 157796 Serjt. W., R.G.A.; Terry, No. 118696 Actg. Cpl. J. J., R.G.A.; Tingley, No. 89622 Bty. Serjt.-Maj. H., R.F.A.; Tomkinson, No. 132221 Serjt. A., R.G.A.; Turk, No. 540094 Actg. Serjt. H. A., R.E.

Walker, No. 465421 Actg. Staff Serjt. Mechanist D. J., R.E.; Wall, No. 121039 Actg. Bty. Qrmr-Serjt. E. T., R.G.A.; Wall, No. 148124 Serjt. T., R.G.A.; Wells, No. 40260 Cpl. H., R.F.C.; Westfield, No. S/38954 Pte. (actg. Staff Serjt.-Maj.) E. N., A.S.C.; Weston, No. 20551 Temp. Serjt.-Maj. E. S., R.F.C.; Williams, 12176 Serjt. (Flt. Serjt.) W., R.F.C.; Wilson, No. 22600 Cpl. C. J., R.F.C.; Wooherry, No. 3401 Cpl. (actg. Serjt.) E., R.F.C.; Worrall, No. 168794 Cpl. (actg. Serjt.) J., R.F.A.

Youngman, No. 284280 Serjt. H. W., R.G.A.



**E · K**  
INSULATED WIRES

ELECTRIC  
**CABLES**

**Nº IIIa  
SPECIAL MAGNETO CABLE**

PASSED THE HIGHEST  
TEST OF THE  
A.I.D.

FLEXIBLES SPECIALLY MADE FOR  
MOTOR CAR AND AERO ENGINES

EST. 1901

**E. KALKER & CO**  
COVENTRY

**Alardux**

Alardux is the New Aluminium Flux

A Welding Flux of exceptional merit

May we send you a sample?

The Alardux Co.,  
23, Fleet Street,  
London, E.C.4.

City 866.

**BUY**  
**Your Streamline Wires**  
FROM  
THE ORIGINAL MAKERS  
**BRUNTONS**

MUSSELBURGH,  
SCOTLAND.

We can supply Wires, plain,  
screwed or fitted with Fork or  
Universal Joints.

**TIMBER**

SILVER SPRUCE  
ENGLISH ASH  
WALNUT & MAHOGANY

.....

**JOSEPH OWEN & SONS**  
Limited

Borough Saw Mills,  
LONDON, S.E.1.

Telephone: Hop 3811. Telegrams: "Bucheron Sedist."



## ON THE ART OF INSTRUCTING.

BY ONE WHO HAS DONE IT.

The Navy and Army comprise at the present moment so many officers and men engaged in giving instruction on something or other, that the following hints will perhaps be of value to many who have been pitchforked into the instructional arena without previous training owing to the great demand for instructors.

It is universally admitted that a good mechanic is seldom also a good demonstrator. To instruct ideally is a great art, so that there exist but few instructors, and such are neither born nor made; Topsy-like, they just grow. On the other hand many instructors in the technical and even the purely military branches of the Army are professional teachers, but these are now engaged upon instructional rather than purely educational work.

With regard to giving instruction in the technical work, to which I have referred above, it must be realised that the cycle of operations in an internal combustion engine, the rigging of an aeroplane, or the system of army storekeeping, are not pegs upon which to hang garlands of oratory, neither are they media of education for education's sake; they are essentially subjects on which, as a rule, definite and specific information has to be imparted with the maximum of thoroughness in a minimum of time.

There is, however, no reason why instructors should not take advantage of every opportunity of helping the pupil to help himself, to develop in the pupils the faculty of initiative, and to encourage self-reliance and general sagacity. There is one very important point to bear in mind, namely, that whatever auxiliary phases the teaching assumes, it must be constructive; there must be a building-up, and the building-up in the mind of the pupil depends very largely upon the constructive arrangement on the part of the instructor of the facts to be imparted.

## ESSENTIAL PRINCIPLES.

First of all, the instructor must distil his subject, until he has collected from the boiling-pan the essential principles. Whether the subject be aero-engines or Army accountancy, or any one of the multitude of subjects which lie between these extremes, each is essentially a bundle of principles.

Let us see if the importance of this point can be emphasised. For example, the man who understands the principles involved in the construction and operation of a Gnome engine is an engineer. But no matter how well a fitter can take down, repair, and re-assemble this or any engine, if he does not understand the principles underlying its construction and operation,

he is not an engineer. Thus we find that it is the grasp of principles that matters, first and always.

In giving instruction then, in any subject, the instructor must first sort out the "bundle of principles." If for some unexpected reason he got no further than this with his class, he might rest content, because the details of construction supplementary to the essential principles will themselves disclose their need, and their use, to any pupil of reasonable intelligence.

Having sorted out the principles, the next thing to plan is the order in which to lay them before the pupil or class. There is always a proper or natural sequence of detail in these matters, which, if discovered and adopted, will result in a progressive development of the principles. For example, in giving instruction on the rigging and adjustment of aeroplanes, the instructor could adopt as a main principle, "True or refined alignment"; and insist that whenever a wire is braced or a nut turned, it must contribute to truth of alignment.

The vital principles having been assimilated, supplementary details of constructional parts, etc., may now be dealt with.

## VIVA VOCE INSTRUCTION.

Here are a few hints on the actual practice of imparting information viva-voce, but the same hints will be found useful by those who present themselves for examination.

1. Be explicit. Answers or explanations may be as comprehensive as possible, but above all they must be clear in meaning.

2. Be direct. Give positive answers, explanations or demonstrations, and give them by the shortest cut. Do not fog a main issue or explanation by desultory cross-issues.

3. Allot to each supporting statement its proper avenue of approach; thus is the main explanation emphasised.

4. Do not give a negative statement in the hope of more firmly establishing the positive. After a pupil has left the lecture-room, especially if he is at grips with several subjects at the same time, he is apt to forget which argument was positive and which negative, and reverse them. This reflects discredit on the instructor.

Let us show this by example. In directing a person along a country road, do not be more definite in telling him which of the next cross-roads he has not to take than in telling him the one he must take. If the correct direction is "the first road to the right," tell him so and leave it at that, then he is practically certain to take the right road.

Instruction in any subject given on the lines of the foregoing paragraphs will result in the instructor knowing what he has imparted, and in the pupil knowing what he has been taught.

## OFFICIAL ACCEPTANCE TESTS

## LAND MACHINES.

Handley-Page	Avro
S.P.A.D.	Blackburn
Sopwith	Armstrong-
B.E.	Whitworth
Short	D. H. 4.
Curtiss	Bristol
Mann, Egerton	Vickers
M. Farman	Nieuport
H. Farman	Supermarine, &c
Morane	

## SEAPLANES.

Short, Sopwith, America	Boats,
F.B.A. Boats,	Curtiss Boats,
Norman-Thompson and A. D.	Boats, &c.

*Private Aerodromes  
Surveyed and Pilots'  
Reports Furnished.*

## DELIVERY AND EXPERIMENTAL FLIGHTS

ON LAND MACHINES &amp; SEAPLANES.

COMPLETE REPORTS FURNISHED.

Rates on application to

THE

PRODGER - ISAAC

AVIATION COMPANY

(C. B. Prodger and Bernard Isaac),

166, Piccadilly, London, W.1.

Telephone: Gerrard 278 (2 lines.)

Telegrams: "Aeromnia, Piccy, London."

## CLIFFORD B. PRODGER,

J. LANKESTER-PARKER,  
and other Pilots.

Approved Admiralty Pilots  
— for Acceptance Trials. —

## INSURANCE.

WE are now in a position to quote low rates, through our brokers at Lloyd's, for the Insurance of Aircraft during ACCEPTANCE TRIALS AND DELIVERY FLIGHTS with an excellent and most comprehensive Policy. May we quote you for your new contracts?

**SPECIAL ARRANGEMENTS with Sub-Contractors for HANDLEY-PAGE Type Land Machines and "AMERICA" Type Flying Boats.**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



THE  
**Eastbourne Aviation Co.**  
LTD.

ESTABLISHED 1911



**AEROPLANE CONSTRUCTORS**  
Contractors to the Admiralty



TELEGRAMS: Aircraft  
PHONE: 1176 EASTBOURNE

# AEROPLANE PARTS

Our 20 years experience in making Rims and Tubular Parts for Cycles, Motor Cycles, etc., is now being utilised in the production of

## AEROPLANE PARTS

and, as in the past, we aim at producing only the highest grade goods, which can always be depended upon to give complete satisfaction. We specialise in

RIMS for AIRCRAFT. TUBES and TUBULAR CONSTRUCTION. SHEET METAL PRESSED PARTS of every description.

SPECIAL SECTIONS in STEEL of any length, gauge or width.

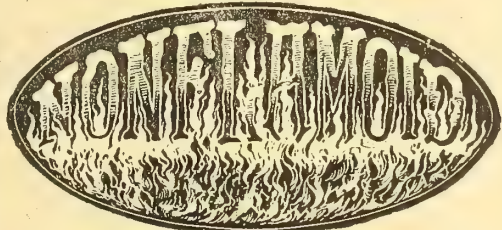
BRAZING. ACETYLENE and ELECTRIC WELDING, etc.

and can make any special parts to instruction. Send us your enquiries

# THE LOMBARD

LOMBARD ST.,  
BIRMINGHAM.

Registered Trade Mark.



Non-Inflammable Transparent Celluloid.

**LONDON LABEL CO., Ltd.,**

Contractors to H.M. Government.

HARLEY WORKS, BECKTON RD., LONDON, E.

**WIND SHIELDS**  
**MAP COVERS**  
**OBSERVATION PANELS**  
*Prompt deliveries of every type.*  
**LUMINOUS PRINTING**

Labels for Instrument boards, &c., for night work.

Any special article made up to templates or drawings and delivered by return.

N.B.—Nonflamoid is very much lighter and easier to work than any kind of glass, also it will stand much harder usage.

# THE AIRCRAFT CONSTRUCTION CO.

EVERY DESCRIPTION OF METAL COMPONENTS.

IMMEDIATE  
DELIVERY OF

## SE5 SUMPS, part 11612-1

**HARLEY AEROPLANE WORKS, Beckton Rd., E. 16**

Telegrams: "Aercracons," Canning, London.

'Phone: East 1300.

## THE ROYAL FLYING CORPS.

FROM A MECHANIC'S POINT OF VIEW.

**AERODROME.**—A large space of land divided into three parts:—  
(1) A muddy portion where the mechanics take exercise. (2) A danger spot surrounded by red flags. (Flying pupils usually land here). (3) A safety stretch where accidents occur.

**AEROPLANE.**—A machine designed for carrying mud from the aerodrome to the sheds. There are three kinds of aeroplanes:—  
(1) Those that fly. (2) Those that don't. (3) Those that stand on their noses.

**PUPIL (Elementary).**—A man who meanders about the aerodrome in an antiquated "bus." He wears a tense expression and hopes his engine will burst before he "gets off."

**PUPIL (Advanced).**—A man who stops his propeller in the muddy portion of the aerodrome, and beckons for assistance. When the mechanics arrive he smiles sweetly, says "Sorry," blames the throttle lever, and does it again next time.

**MECHANIC (2nd Class).**—A hapless individual who wears baggy overalls, and is certain that he'll get his "First" next month.

**MECHANIC (1st Class).**—A confident youth who knows the Christian names of all the sergeants.

**MOTOR TRANSPORT DRIVER.**—A man with a past, who talks in a superior manner of Talbots and speed records, and then drives a Ford box into the nearest ditch.

**ACTING CORPORAL.**—A person.

**CORPORAL.**—A sort of Jack-in-the-box who seems to know by instinct the whereabouts of the Flight-Commander.

**SERGEANT.**—A man with an enormous appetite who is promoted to Flight-Sergeant if the 2nd A.M.'s work hard enough.

**FLIGHT-SERGEANT.**—A species of sergeant with a louder voice and seven shillings a week extra.

**QUARTERMASTER-SERGEANT.**—A N.C.O. of great versatility. He can guess the weight of  $\frac{3}{4}$  lb. of meat to within 11 ozs., and he is capable of giving hints to the producers of "The Clutching Hand."

**SERGEANT-MAJOR.**—A man who can see at a glance whether a mechanic shaved in the morning, or the night before. His regimental name is "Sir!!"—and don't forget it!

**EQUIPMENT OFFICER.**—Petrol expert, car expert, aviation expert, and spends his spare time paying for deficiencies, and going bald.

**ADJUTANT.**—Sh!

**INSTRUCTOR OF FLYING.**—!

**CAPTAIN OF FLIGHT.**—!!

**MAJOR.**—!!! (I dare not say more, fear less I get caught).

**TECHNICAL STORES.**—This is a building, or part of a building, where worried-looking individuals collect blue forms and issue nuts and bolts of the wrong sizes. Now and again a mechanic obtains what he really wants. On these occasions all the storemen are promoted and the Equipment Officer gets—No he doesn't, he's a teetotaler.

**LEAVE.**—Leave is granted so that the revenue of the Post Office shall be increased. A man applies for leave because his grandmother is expecting another funeral, or his brother is going to the Front. The local police receive a telegram asking them to make inquiries. The reply telegram, of course, is in the affirmative. The man is permitted to go, but before he arrives at his home a telegraphic message is sent recalling him. He telegraphs to his best girl, telling her the theatre party is off, and then telegraph to his C.O. explaining that he has missed the last train, and can he return in the morning. The C.O. wires back he must return at once, so he catches the next train and returns at once.

**FIRST FLIGHT (of a mechanic).**—This is a very important affair, and consists of several stages:—

(1) **THE PERIOD OF PREPARATION**, during which the mechanic robes himself in a borrowed helmet and goggles, and tries hard to behave as if he were quite used to such ordinary events.

(2) **"GETTING OFF."**—The pilot feels cheery and decides to "put the wind up" his victim, who suddenly discovers that the machine has left the ground and is rushing with awful speed towards the sheds. The unhappy passenger curses the Flying Corps and wishes he had joined the infantry. His eyes bulge out to such an extent that they nearly scratch the wind screen. The R.F.C. motto, "Per ardua ad astra," rushes through his mind with a new meaning, and when he has nearly choked for want of breath the nose of the machine dips down, so that he gasps in sheer despair, but before he has finished his gasp, his neck clicks and he sees the nose of the engine shoot up towards the sky and he discovers that the sheds are three hundred feet below and behind. He begins to breathe again and struggles round to look at the pilot, who grins good-humouredly and shouts, "some stunt." The mechanic feebly smiles agreement, but thinks "some idiot."

(3) **BANKING.**—The machine dashes away climbing rapidly against the wind. The passenger begins to gain confidence and ventures to look over the side. The land has taken on a new aspect and appears to be a Gamages' toy farm. He becomes fascinated and is just deciding that he'll make a good aviator, when his equilibrium receives another shock. The left wing drops

## Books to be Noted—and Bought

**The Aeroplane Speaks**

By CAPTAIN H. BARBER, R.F.C.,  
5th edition. 6s. 6d. net, 7s. post free.

**Military Aeroplanes**

By G. C. LOENING. 6th edition. 21s.  
net, 21s. 6d. post free.

**All the World's Aircraft**

Edited by C. G. GREY. 21s. net, 22s.  
post free.

**Aeroplane Design**

By CAPTAIN H. BARNWELL. With  
a Chapter on Inherent Stability, by  
LIEUT. SAYERS. 2s. 6d. net, 2s. 9d.  
post free.

**An Airman's Outings**

By "CONTACT." 5s. net, 5s. 4d. post  
free.

**Air Navigation for Flying Officers.**

LT.-COM. A. E. DIXIE, R.N. 10s. 6d.  
net, 11s. post free.

**The Flying Book**

Edited by W. L. WADE. 3s. 6d. net,  
3s. 9d. post free.

**Ballads of the Flying Corps**

By G. R. SAMWAYS, R.F.C. 2s. 6d.  
net, 2s. 9d. post free.

**Songs of the Submarine**

By "KLAXON." 2s. net, 2s. 3d. post  
free.

**Small Factory Output**

By G. H. MANSFIELD. 1s. 6d. net,  
1s. 9d. post free.

Any of the above books may be ordered through the  
Bookseller or will be sent on receipt of remittance by  
The Wm. Dawson Publishing Co., Rolls House, Breams Buildings, E.C.



**AIRCRAFT DEPARTMENT**

THE WORLD'S LARGEST MANUFACTURERS OF ALL KINDS OF ENGRAVED METAL GOODS.

**British Metal (Kingston) Ltd.**  
*The Factory,*  
 Kingston-on-Thames

**DIALS & INSTRUCTION PLATES**  
 MADE IN ANY METALS,  
 IVORY, IVOROID, BONE, ETC.  
 ANY QUANTITIES, WORDING, DESIGN,  
 SIZE, SHAPE OR COLOURS.

COMPLETE SHEET METAL  
**AIRCRAFT COMPONENTS**  
 RIVETED, SWEATED, BRAZED OR WELDED.  
 R.E.8, F.E.2B.&D, B.E.2C-D-E,  
 SE5, DE H6.  
 RESIDENT A.I.D. EXAMINER.

## R.N.A.S. KIT

### BURBERRYS

supply Uniforms, Weatherproofs, Leather Coats, British Warmes, Fur Undercoats, Caps, and every detail of R.N.A.S. dress and equipment, at reasonable prices.

### BURBERRY KIT

made in special cloths, woven and proofed by Burberrys, provides an effective safeguard against wet or wind, and, whilst lightweight, is the warmest and most comfortable equipment for facing the atmospheric conditions of varying altitudes and climates.

**Complete Kits in 2 to 4 Days or Ready-to-Wear**

#### Service Weatherproofs.

During the War BURBERRYS CLEAN AND RE-PROOF Officers' "Burberrys," Tielocks, Buffrons, & Burberry Air-Warms **FREE OF CHARGE**



Illustrated Naval Catalogue Post Free

Every Burberry Garment is labelled 'Burberry'

**BURBERRYS Haymarket S.W. LONDON**  
 8 & 10 Bd. Malesherbes. PARIS; also Provincial Agents

**ROK ROOFING**

facilitates the speedy erection of Hangars by combination with our famous "Belfast" Girder Principals in

**ANY CLEAR SPAN UP TO 100 FEET.**

**BRITISH & BEST**

*Write for Booklet "R."*

48

**D. ANDERSON & SON, Ltd.,** Lagan Felt Works, Belfast; and Roach Road Works, Old Ford, London, E.

**MOSS-AERO-ENGINE GEARING**

Manufactured on principles ensuring greatest

**STRENGTH AND ACCURACY.**

**GEARING FLYWHEELS CAMSHAFTS**  
 R.A.F. PROPELLER BOSSES

Our Aero parts are made in specially **HIGH TENSILE STEEL**, heat treated and all parts corrected for distortion.

**TRANSPORT, LORRY & PLEASURE CAR GEARING**

Bevel and Worm Drives accurately generated. Steering Worms and Sectors. Spur and Bevel Differentials. Gear Box Gears. Camshafts with guaranteed Glass-hard Cam Profiles.

**-GEARING**

**THE MOSS GEAR CO., LTD.,**  
 W. DUCKITT Managing Director, Thomas St., Aston, BIRMINGHAM

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





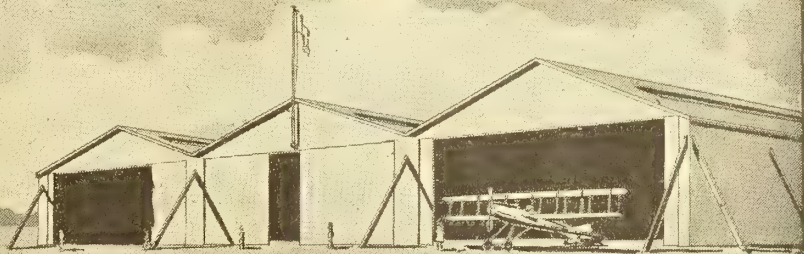


# T.W. PALMER & CO.

MERTON ABBEY IRONWORKS  
LONDON · S.W. 19

ESTIMATES  
FREE

DESIGNERS · MANUFACTURERS AND  
ERECTORS OF EVERY DESCRIPTION OF  
AIRCRAFT BUILDINGS  
TEMPORARY OR PERMANENT



WORK · CARRIED · OUT · TO · OUR · OWN · OR · CUSTOMERS · DESIGNS

# STRANDS & CABLES

FOR ALL AVIATION PURPOSES.

Composed of Tinned Steel Wire of the Highest Quality.

:: Descriptive Booklet on Application.

Head Office  
and Works:

**GEO. CRADOCK & Co., Ltd., Wakefield.**

London Office: 7, EAST INDIA AVENUE, E.C.3.

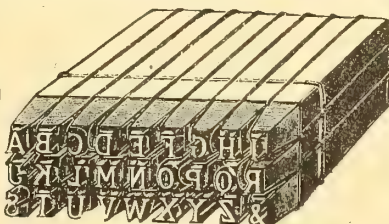


STEEL HAND PUNCH

## STEEL

STENCIL  
PLATES

PHONE:  
EAST 3.81 (LINES)



STEEL LETTERS & FIGURES  
CONTRACTORS TO HIS  
MAJESTY'S GOVERNMENT.

## STAMPS

BRANDING  
IRONS

TELEGRAMS:  
DAYLOR, PHONE, LONDON.

**JOHN MEERLOO & SONS**

CLEVELAND WORKS, CLEVELAND STREET,  
MILE END, LONDON, E.1.



SET ROD STAMP

We make  
a  
Speciality  
of every  
Description



NAME &  
ADDRESS PLATES

IN IVORY · IVORINE · BRASS  
GERMAN SILVER COPPER  
TABLETS FOR ALL PURPOSES  
Prompt Delivery Guaranteed  
ENDOLITHIC MFG CO LTD  
6 1/2 Fore Street  
LONDON E.C.4

of Plates,  
Gauges and  
Dials for  
Aeroplanes,  
etc., etc.

Write for our "A" List.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



time getting round. Heavens! he can't get straight and were falling sideways." Round and round they go while the machine appears to do a giddy falling spin on the lower wing tips—"I promised Maud I'd never fly, and now—" His breath does a topsy-turvy stunt as he sees the earth performing all sorts of acrobatic tricks. Almost two seconds have elapsed since the spiralling commenced, but ten minutes seems quite a small estimate. "If we ever get out of this I'll never have another joy ride—Never!" He tries hard to look at the pilot, but the rushing wind squeezes him down into his seat and a few more agonising ten minutes go by.

At last—what relief—the aeroplane flies straight again and the engine picks up her "revs." once more. "I knew we were safe—he's a fine pilot." He looks down again and finds the earth quite near and the aerodrome sheds about two miles distant.

The engine is suddenly throttled down and the machine's nose rips as they glide towards the landing ground. He feels the wheels touch the ground, and he decides he'll never swear again nor smoke any more cigarettes. They bump over the ground and swing round in front of the sheds—"Thank you very much, Sir."

"How did you like the spiral?"

"Er—the spiral?—Oh! the best sensation I've ever had!"

"That's good—Rather a nice spiral!"

He gets out of the "bus" and strolls with a fine show of sang froid to the other mechanics.

"What was it like?"

"Great—I enjoyed it no end."

"You look a bit pale."

"Ah! that's the wind—rather cold, you know."

"Are your feet cold?"

"Yes, a bit."

"Thought so!"

"I suppose we were up about an hour?" (Said with great unconcern.)

"Seven minutes, old man."

"Seven—? Well it seemed much longer."

"Yes the time does drag when you thoroughly enjoy yourself."

He goes to the sheds with a feeling that he is discovered. You see "cold feet" in civilian language means "fright!"—  
R. C. V.

## THE JABBERWOCK (NEW STYLE).

(A TRUS STORY OF 1917.)

"Twas Brillig, and the slithy Quirk\*  
Did drone and burble in the blue.  
All floppy were his wing controls—  
(And his observer, too!).

"Beware the wicked Albatros!"

The O.C., Quirks had told him flat;  
"Beware the Hun-Hun bird, and shun  
The frumious Halberstadt!"

And while through uffish bumps he ploughed,  
The Albatros, with tail on high,  
Came diving out the tulgey cloud,  
And let his bullets fly.

One, two, one, two; and through and through,  
The Lewis gun went tick-a-tack;  
The Hun was floored, the Quirk had scored,  
And came split-airing back.

"Oh, hast thou slain the Albatros?  
Split one with me, my beamish boy;  
Our RAFish scout has found them out!"  
The C.O. wept for joy.

\*R.F.C. for a B.E.2c.

That 1918 may be  
A VICTORIOUS NEW YEAR  
for the  
FLYING SERVICES  
Is the Wish of all Readers of "The Aeroplane."

## ACETYLENE Welding Process.

SUCCESSFUL results depend ENTIRELY upon skilful use of Apparatus, properly designed, and accurately made.

Our Experience enables us to place such apparatus on the market, and its use makes unskilled operators become skilful.

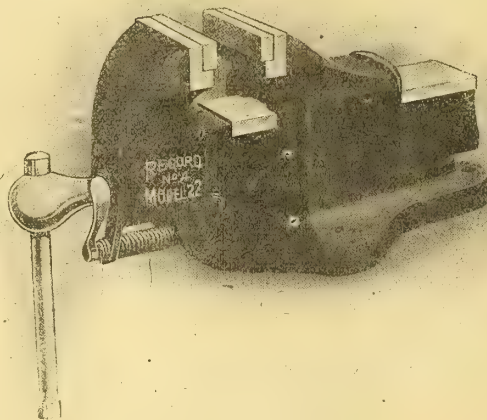
TAKE CARE to instal the Best Apparatus and the Best Results will follow.

For all Acetylene Apparatus, High and Low Pressure, Generators, Purifiers, Blowpipes, Filling Wires, Fluxes. &c., &c.

THE  
Acetylene Equipment Co., Ltd.  
(The Pioneers of Oxy-Acetylene Welding),  
268, SOUTH LAMBETH ROAD, S.W.8.

BRANCHES:  
Birmingham, Cardiff, Manchester, Liverpool,  
Newcastle, Glasgow, Bristol.

## BENCH VICES



PROMPT DELIVERIES.

G. & J. HAMPTON, LTD.,  
SHEFFIELD.

TELEGRAMS: "VICES, SHEFFIELD."



# JAMES PUTMAN, Southern Works, AYLESBURY

Manufacturer of Aero Hangars and  
every Description of Canvas Work.

SEVEN AND A HALF ACRES OF WORKSHOPS.

Contractor to Air Board, War Office, Admiralty,  
Ministry of Munitions and H.M. Office of Works.

Phone : 57 Private Branch Exchange.  
Telegrams : "Putman, Aylesbury."

## The OUTPUT and EFFICIENCY of YOUR FACTORY

CAN BE GREATLY INCREASED BY ADOPTING  
MODERN METHODS OF LIGHTING AND  
MACHINE DRIVING BY ELECTRICITY.

THIS SUBJECT IS MY CONSTANT AND SPECIAL STUDY.

Ask for Booklet on

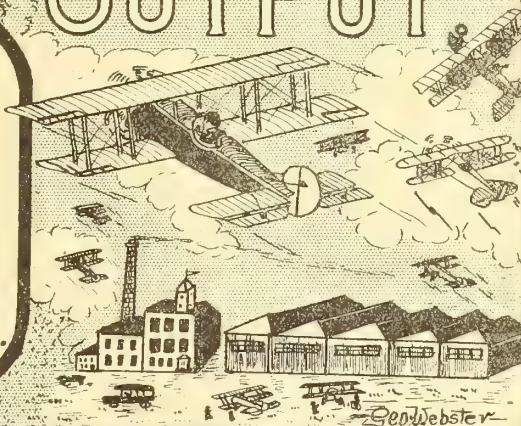
"Modern Machine Tool Lighting."

Contractor to the WAR OFFICE, MINISTRY OF MUNITIONS, H.M. OFFICE  
OF WORKS, and some of the leading Aeroplane Makers.

**E. STANLEY FARDON, AMIEE.**

67, MOSLEY STREET,  
MANCHESTER.

# OUTPUT



# RIBBLETS

# FAIRINGS

# HINGES

**BUNCHER & HASELER LTD.**  
STAMPERS & SPINNERS  
BIRMINGHAM.

## A.G.S. WASHERS

Wire  
Work.

## THIMBLES

## UNION NUTS & NIPPLES.

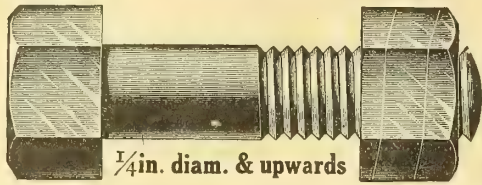
**W. H. BRISCOE & Co., Ltd.,**  
51, 52, 53, PARK STREET,  
BIRMINGHAM.

Turn Buttons.  
Eyelets.  
Washers.

Tel.: 550 Central  
Tel. Ad.: BRISK, BHAM.



## BRIGHT BOLTS & NUTS



1/4 in. diam. & upwards

(Suitable for Every Description of Engineering Work)

QUALITY, ACCURACY AND FINISH GUARANTEED

### THE "HELICOID" LOCK-NUT

(THE FINEST LOCK-NUT IN THE WORLD.)

This nut will remain secure, no matter how great the vibration may be—in fact vibration actually tightens the grip.

(made from 1/2 in.  
to 2 1/2 in.)



(sample nut & prices  
on application)

We also manufacture Wrought Iron Railing and Gates, etc.

**BAYLISS, JONES & BAYLISS,**  
LTD.  
**WOLVERHAMPTON.**

London Offices: 139/141, CANNON ST., E.C.4.

## AIRCRAFT COMPONENTS

QUICK DELIVERY  
OF ALL  
DESCRIPTIONS OF  
AEROPLANE  
COMPONENTS.



METAL FITTINGS,  
ETC., ETC.

'PHONE: LONDON WALL 6725.

**National Aircraft Mfg. Co.**  
15, HACKNEY ROAD, LONDON, E.2

## AEROPLANE



## ACCESSORIES

7 Years' Experience.

Contractors to H.M. Government.

## SWIFT AVIATION CO.

Dolphin Engine Plates in Stock,  
Complete Sets.

*Speciality Sopwith Spares.*

## KINGSTON

PHONE—  
762 KINGSTON

'GRAMS—  
"SWIFT, KINGSTON"



# B·G·L

METAL COMPONENTS  
FOR  
AIRCRAFT

Tube Work and Metal  
Fittings for Rudders, Fins  
and Tail Planes.

THE BIRMINGHAM GUILD LTD  
GT. CHARLES STREET, BIRMINGHAM.

## Rustless Fittings FOR AIRCRAFT.

*We supply complete  
Plants for Electro-  
Zincing or Cold Gal-  
vanising Aeroplane  
Fittings by a process  
approved by the  
Government, also  
complete Sherardi-  
sing Plants. ::*

**The Rustless Iron (Cowper-Coles Process) Ltd.**

CONTRACTORS TO THE WAR OFFICE AND ADMIRALTY

**1, French Street,  
Sunbury-on-Thames, Middlesex.**

Tel: 37 SUNBURY.

## Aircraft Fittings.

### GABRIEL & CO.

*Manufacturers of*

**AEROPLANE FITTINGS in BRASS,  
COPPER, GUN METAL, BRONZE  
AND CLARUS ALUMINIUM.**

Castings supplied either Machined complete  
or in the rough.

Sheet Metal Work in Brass, Copper, Steel,  
Tin, or Aluminium, including Spinnings,  
Stampings and Pressings.

**A.G.S. FLANGES, PETROL FILTERS, ETC.**

Tube Bending and Capstan Work a speciality.

*Contractors to Admiralty, War Office,  
Ministry of Munitions, H.M. Air Board,  
Royal Aircraft Factory and Crown  
Agents for the Colonies.*

TEL. ADDRESS:  
GABRIEL, BIRMINGHAM  
TELEPHONE:  
CENTRAL 1223.

**4 & 5, A. B. ROW,  
BIRMINGHAM**

## LEARN TO FLY

— AT —

### Bournemouth.

— THE —

**LARGEST AND MOST UP-TO-DATE  
CIVILIAN SCHOOL IN ENGLAND.**

*Immediate Vacancies.*

**RAPID TUITION.**

43 Caudron Service Biplanes (Solo & Dual Control).

**SPECIAL TRAINING**

for Pupils intending to enter the R.F.C. or R.N.A.S.

**APPLY :**

**Bournemouth Aviation Co., Ltd.,  
AERODROME, BOURNEMOUTH. (Phone 1160).**

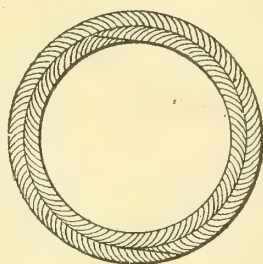
THE MIDLAND MOTOR CYLINDER CO. L<sup>TD</sup>  
SMETHWICK  
TELEPHONE—289 SMETHWICK

N<sup>R</sup>. BIRMINGHAM  
TELEGRAMS—RAFWORK, SMETHWICK

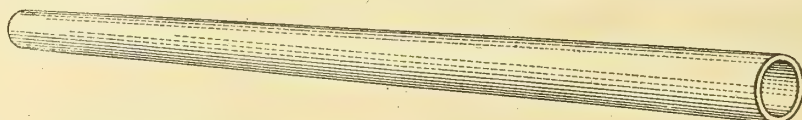
**SPECIALISING IN**

**AERO ENGINE CYLINDERS IN IRON AND ALUMINIUM TO PASS ALL GOVT. TESTS**

WE HAVE THE LARGEST OUTPUT OF AERO-ENGINE CYLINDER CASTINGS OF ANY BRITISH MAKER



Patent No. 4704/15.



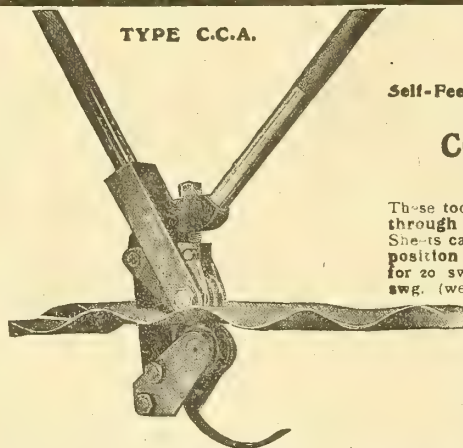
**McGRUER SPARS**

are THE ACME of  
**STRENGTH and LIGHTNESS**

Particulars from:—

**McGRUER BENTWOOD HOLLOW SPAR Co.,**  
Commercial Wharf, Lambeth, LONDON, S.E.1.

TYPE C.C.A.



**TANGENT**

Self-Feeding HAND TOOLS Non-Distorting  
FOR CUTTING

**CORRUGATED SHEETS**

PATENT.

These tools will cut sheets on any angle, limited curves and through the centre with no distortion of cut edges. Sheets can be cut to required shape when being fixed in position on the job. Made in two styles, as illustrated, for 20 swg. (weight 5 lbs.), with compound leverage for 18 swg. (weight 6½ lbs.). Cuts 1000/0 faster than any other hand method.

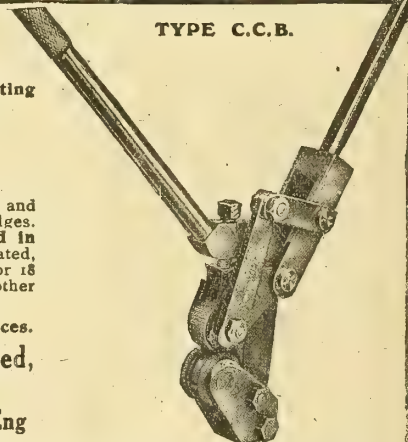
Write for Illustrated Pamphlet and Prices.

**Montgomery, Smith & Co., Limited,**

Patentees and Manufacturers,

Tangent Wks., Keynsham, Somerset, Eng

TYPE C.C.B.



**“NOVELLON” DOPE**  
**AND AEROPLANE VARNISH.**  
**CELLULOSE ACETATE & CHEMICALS**

**BRITISH CELLULOSE & CHEMICAL MANF'G.**  
**COMPANY, LIMITED.**

Telegrams:

Cellutate, London.

8, WATERLOO PLACE, S.W.1.

'Phone: Regent 4045.

Works: Spondon, Derby; and Maybury Gardens, High Road, Willesden Green, N.W.10.

(Telephone: Willesden 2380.)



'Phone: BOURNEMOUTH 2039.

Telegrams: 'WORMS, BOURNEMOUTH.'

CONTRACTORS TO H.M. ADMIRALTY &amp; WAR OFFICE.

**WORMS AIRCRAFT CONSTRUCTION CO.**

(MAX WORMS)

Rutland Works, Rutland Road,

**BOURNEMOUTH.**

London Office:

4, SACKVILLE STREET,  
PICCADILLY, W. 1.

Telegrams: "HUNFYTA, PICCY, LONDON."

**AIRSHIPS, LTD.**

Manufacturers of Airships and Kite-Balloons

Contractors to the Admiralty

London Office:

47, VICTORIA ST., S.W.

Works:

HIGH ST., MERTON, and HENDON



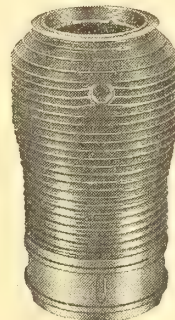
THE  
Beverley Engineering Works  
(Valcke & Dolphens)

**Aeroplane Cylinders**

Clerget

Le Rhône

Gnome



WILLOW AVENUE, BARNES, LONDON.

'Phone: Putney 478

**PLYWOOD**

In all Thicknesses and Qualities.

**SIBERIAN & GENERAL TRADING CO, Ltd.,**

1-3, Leonard Street, City Road, LONDON, E.C.2.

Telegraphic Address: "Wolosey, Finsquare, London."

Telephone: London Wall 577.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

# Auster

(1914) LTD

for **AUSTER-TRIPLEX SHIELDS**  
**AERONAUTICAL ACCESSORIES**

LONDON: 133, Long Acre, W.C.

Telephone: Regent 5910.  
Telegrams: "Winflector, London."

BIRMINGHAM:

Crown Works, Barford Street.

Telephone: Midland 2123.  
Telegrams: "Auster, Birmingham."

## THE "BOWSER" AEROPLANE SEATS

(Made to A.G.S. Drawing 264).

Supplied to the Royal Aircraft Factory and the Leading Aircraft Manufacturers.

Manufactured by **EDWARD BOWSER, 50, Park Lane, Leeds.** Tel. No.: Central 3473.

Under the A.I.D. Inspection.

Northern Representative—

Mr. WALTER M. DANIELL,

33, East Beach, Lytham.

## 'FEARLESS' ENGINE CLEANING BRUSHES

As used by  
the R.F.C.



Send Trade Card  
for  
**FREE SAMPLE.**

**FEARLESS BRUSH CO., LTD.,** 4, NORTHWOLD RD. LONDON — N.16.

TELEGRAMS:  
"EDIBRAC, PHONE,"  
LONDON."

## IMPERIAL LIGHT LTD.

123, VICTORIA STREET, LONDON, S.W.1.

TELEPHONE:  
3540 VICTORIA  
(3 LINES).

## FLUXES FOR WELDING

# HEATING

By Steam or Hot Water  
HANGARS, DOPE SHOPS & AIRCRAFT WORKS

and a complete system of

**CHAS. P. KINNELL & Co., Ltd.,**  
65, Southwark Street, London, S.E. 1.

# VENTILATION

# Lang Propeller

LTD.

Contractors to  
the Admiralty  
and War Office.

**WEYBRIDGE,**  
SURREY.

## HIDE GLUES

**FOR AIRSCREWS AND  
AIRCRAFT CONSTRUCTION.**

— APPROVED BY H.M. ADMIRALTY AND A.I.D. —

Manufacturers — **Wm. OLDROYD & SONS Ltd., 9, Mincing Lane, London, E.C.3.**

Telephone: 4978 Avenue.

# STANLEY PROPELLERS

By the **STANLEY AVIATION CO.,**

TELEPHONE  
CITY, 8347.

67, KINGSLAND ROAD,  
LONDON, E.2.

GOVERNMENT  
CONTRACTORS.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



## Dials, Instruction Plates, ETC.,

in Brass, Copper, Aluminium,  
Ivory. We specialise in  
above for the Aeroplane  
industry, both chemically and  
— machine engraved. —

**CLEGG METAL ENGRAVING Co.**  
CHATSWORTH WORKS, WORTHING.

## GRACE & MARSH

for all classes of finished

## WOODWORK FOR AEROPLANES.

*Aircraft Works,*

*Tamworth Road,  
Croydon.*

'Phone :  
1576 Croydon.

## EARN WHILE YOU LEARN.

'HOW TO MAKE MONEY BY WRITING.'

**£50 IN CASH PRIZES.** Send 2d. postage for Particulars and Copy of "How to Earn Money While Learning How to Write for Newspapers and Magazines." Practical and comprehensive Course of Personal and Private Correspondence Instruction in all kinds of Writing—Reports, Articles, Sketches, Verses, Poetry, Songs (words), Short Stories, Serials, etc., by experienced Literary Directors. Work criticised constructively. **Free Advice.** Beginners taught how to make work saleable. MSS. placed for publication at highest rates of remuneration. **Cash paid immediately on acceptance.**

Address : "EDITORIAL" (Dept. R.),  
22, CHANCERY LANE, LONDON, W.C.2.

## CLABOUR-WESTBAY

:: FOR ::

## 2.B.A. Bolts—A.G.S. 103

Entire Output at present absorbed  
—by Government Requirements.—

**W. A. Clabour, Westbay & Co.,**  
KIRKSTALL, LEEDS. Ltd.

Phone : Headingley 709.

Telegrams : Clabour, Kirkstall.

## Berling Magneto

insures a hot, fat  
spark at any  
altitude

Worth more  
Does more



Manufactured  
by the  
**Ericsson Mfg. Co.**  
Buffalo N.Y. U.S.A.

STAMPINGS  
WASHERS  
REPETITION WORK  
in all Metals

BRIGHT DRAWN STEEL  
FOR

AIRCRAFT and MOTOR WORK

**J.B. GUTHRIE & SON**

(JOHN J. GUTHRIE)

**30, ST. MARY AXE, LONDON**

TELEGRAMS—BUSIRIS LED, LONDON. E.C.3.  
ELEPHONE—AVENUE 1432.

*The Best*

# Piston Rings

Scientifically designed. Made from high tensile cast iron and hammered to give an even radial distribution of pressure. Gaslight. Sizes up to 30 in. diam.

**The BRITISH CHUCK & PISTON RING CO. LTD.**  
Holbrook Lane, COVENTRY

*The Air Navigation Co., Ltd.*

## BLERIOT & SPAD AIRCRAFT WORKS, ADDLESTONE (SURREY).

**Contractors to War Office and  
Admiralty.**

**Flying Ground—Brooklands Aerodrome.**

**NORBERT CHEREAU, Managing Director.**

Telegrams—Bleriot, Weybridge.

Telephone—353 Weybridge.



## TRADE CARDS.

**AEROPLANE TIMBER SPECIALISTS**

**JOSEPH OWEN & SONS, Ltd.,**  
**Borough Saw Mills, LONDON, S.E.**

Telephone: HOF 8811 Telegrams: "BUCHERON, SEDIST."

**B.D.V. AIRCRAFT SPARES**

ALL KINDS OF METAL FITTINGS, TUBE  
 WORK, SHEET METAL WORK, STAMPINGS,  
 :: WELDING, AND ALL COMPONENTS. ::

Enquiries to **B.D.V. Aircraft Spares,**  
 PRINCES STREET WORKS, RICHMOND, SURREY.

Telegrams: "Aeros, Richmond."

'Phone: Richmond 1681.

**JAMES NORTH HARDY & SON, LTD.,**

54, PORTLAND STREET, MANCHESTER.

MANUFACTURERS of all descriptions of COTTON and LINEN  
**WEBS, TAPES & TWINES FOR AIRCRAFT  
 AND ELECTRICAL WORK.**

London Branch: 3, FITCHETT'S COURT, NOBLE STREET, E.C.

Mills: HEATON PARK, nr. MANCHESTER.

Tel. Add.: "Hardson," Manchester 'Phone: No. 6471 Central.

**Springs! Springs! Springs!**

We make a speciality of  
 Springs for Aeroplanes.  
**SEND FOR PRICES.**

**Dart Spring Co., West Bromwich.**

**Chauvière's famous Integral Propellers**

HOLD ALL RECORDS; USED BY ALL  
 LEADING AVIATORS. THE BEST

Sole Proprietors for Great Britain and Colonies

**THE INTEGRAL PROPELLER CO., LTD.,**

Edgware Road, The Hyde, Hendon, N.W. 9.

Telephone—Kingsbury 104. Telegrams—"Aviprop, Hyde, London."

**METRIC BOLTS & NUTS (5 m/m to 8 m/m).**

Stock Lists on Application.

**CASHMORE BROS.,**

TELEPHONE:  
 415 BATTERSEA

**Zota**

**Works**

**HILDRETH ST.,  
 BALHAM, S.W.**

Screw-Cutting and Light Engineering. Accessories for Aircraft,  
 Electrical and Motor Trades. Brass and Iron Founders.

**SAVE TIME.****H. DUNSHEATH & CO.,**

Makers of Every Description of

STEEL MARKS, DIES, LETTERS, FIGURES, BRASS  
 STAMPS AND IRON BRANDS.

Seals, Brass, Tin and Zinc Labels, Time Checks, Stencil  
 Plates, Brass Name Plates, Rubber Stamps, &c.

**30, ARUNDEL STREET, SHEFFIELD.**

Trade **MENDINE** Mark.

**LIQUID SCOTCH GLUE**

USED BY THE LEADING AEROPLANE CONSTRUCTORS.  
**MOISTURE PROOF.**

Write for Price List and Particulars

**MENDINE CO., 8, Arthur Street, London Bridge, E.C.**

**EBORA PROPELLER COMPANY LTD**

*Ebora*

**PROPELLERS**

Contractors to the ADMIRALTY & WAR OFFICE  
 11 & 12 SURBITON PARK TERRACE, KINGSTON-ON-THAMES

Telephone: KINGSTON 672

Telegrams: "EBORA, KINGSTON"

**NAME PLATES.**

WE SPECIALISE IN EVERY DESCRIPTION OF  
 NAME PLATES IN METAL, IVORINE, ETC.

**CLEGG METAL ENGRAVING CO.,**  
 CHATSWORTH WORKS, WORTHING.

**TIMMS ENGINEERING WORKS**

Makers of Jigs, Fixtures, and Special  
 Tools; also Aero Engine Compo-  
 nents and Gearing in quantities.

8a William St., West Kensington, w.14

**SCREW-DRIVING**

**RUSSELL BROTHERS, Ltd., REDDITCH**

**MACHINES.****FREDK. WARD**

— FOR —

**Aero Engine and Gun Gear Parts**

ALSO PATTERN AND JIGS.

**ALLSOP ST., UPPER BAKER ST., N.W.**

Phone: Paddington 4743.

**Printing**

Catalogues, Booklets, Leaflets, Showcards,  
 etc., designed, written, illustrated and  
 produced. Commonsense Ideas and Good  
 Style at moderate cost.

GODBOLDS, 8, BREAMS BUILDINGS, E.C.4.

'Phone  
 City 6912



## MISCELLANEOUS ADVERTISEMENTS.

## AIRCRAFT PARTS.

**Hardwood for Aeroplanes.**—Specially Selected air-dried timber as supplied to leading constructors in Britain and the Continent. Silver Spruce, Ash, Poplar; Hickory and Ash Skids; Three-ply; Thin Cedar and Mahogany or Floats; Walnut for Propellers.—William Mallinson and Sons, Ltd., Hackney Road, Phone, 3845 Central, 4770 Wall.

**Tapes, Webs, Cords and Threads** in all qualities, suitable for Aircraft Work. Delivery from stock.—John MacLennan and Co., 30, Newgate Street, London, E.C.1. (See Advertisement Page iii of Cover and Buyers' Guide.)

**Aeroplane Seats** to any drawing or specification. Prompt deliveries.—F. C. Chappell, 9, Fisher Street, Nottingham.

**A.G.S. Fittings**, all brass and gunmetal series supplied. Petrol cocks, etc.—H. Burton and Co., Ltd., Cannon Works, Willesden, N.W.10.

**Aeroplane Seats.** We can give quick delivery of cane seats, A.G.S. 264 or other patterns, guaranteed pass inspection. Write us for anything required in cane work.—The Willowbrook Company, Leicester.

## WANTED.

**Wanted Woodwork** for aeroplanes, very large up-to-date factory, fully equipped with latest machines; any class of aircraft work undertaken; prompt deliveries; best work.—Apply Box 3030, THE AEROPLANE, 166, Piccadilly, W.1.

**Aeronautical Sheet Metal Works**, 16, Warple Way, Acton, W. All kinds of sheet metal work, tanks, and fittings. Gauge manufacturing.

**Wire Work.** Splicing wanted by practical man well up in small intricate work, in or outdoor. Star shell parachutes a speciality.—Box No. 3264, THE AEROPLANE, 166, Piccadilly, W.1.

**Washers**, turned steel AGS 160, 161, and similar. Small manufacturer requires one or two running sub-contracts to fill up increased production facilities. Prompt weekly deliveries at competitive prices.—Apply Box No. 3245, THE AEROPLANE, 166, Piccadilly, W.1.

**A Well-equipped Works** wants contracts for the machining of aeroplane or aero engine spare parts; accurate work and speedy delivery.—Write to A. Morelle, 14, Kensington Park Road, London, W.

**Wanted** to purchase outright, the contents of small machine shop. Purchaser will undertake to complete existing contracts if approved. Full particulars required as soon as possible from principals only.—Box No. 3258, THE AEROPLANE, 166, Piccadilly, W.1.

**Wanted** ex stock, a quantity of wire and cut nails, all sizes; also box hooping. Delivered London, for cash.—"N.", Box 120, Spottiswoode's, Kingsway Hall, W.C.2.

## MISCELLANEOUS.

**£30 Reward**, which will lead to the recovery of a 11.9 two-seater "Perry" car, painted green, Lucas black lamps, Dunlop tyres, all springs covered black leather. Missing from Harewood House, Hanover Square, W., 7.30 p.m., Jan. 2nd.—Information should be sent to L. S. B. H., 4, Queen's Gate, S.W., or to the nearest police station.

**Nerve Failure** speedily cured, self-consciousness eliminated, concentration increased, and confidence restored by sympathetic hypnotic suggestion. Interesting explanatory booklet post free.—Robert McAllan, Regent House, Regent Street, W.1.

## AVIATION INSTRUCTION

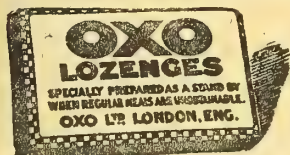
on up-to-date lines, by a qualified Engineer in Aeronautics. Demonstrations from complete set of parts, and sectioned models.

Send for Prospectus No 1.A.,

THE MOTOR TRAINING INSTITUTE LTD.,

16, Heddon Street, Regent Street, W.1.

**Luminous paint** for wrist watches, clocks, match boxes, etc.; remains luminous for years. Bottles 1/6 and 2/9.—Tobin & Co., 39, Charles Street, Hatton Garden, E.C.



# OXO LOZENGES

OXO LOZENGES are just the thing to carry on with until a more substantial meal can be obtained. They contain a high percentage of Beef Extract and Beef Fibrine, and are stimulating and sustaining. Ready for immediate consumption whenever and wherever required.

A Customer writes:—

"I find them very sustaining."

9d. PER TIN.

Of all Chemists, Grocers and Stores, or from  
OXO Limited, Thames House, London, E.C.4.

Y.E.S. Telephone: 4 E.S. LEEDS.

## Y.E.S. PHOSPHOR BRONZES

(Cast by 'EATONIA' Process.)

## Y.E.S. 'AERO' BRONZE

(Under A.I.D. Inspection.)

PERFECTLY ROUND SMOOTH BARS, for Automatic Machines, up to 3' 6" long.

THE MOST DURABLE YET PRODUCED.

SOLE PRODUCERS AND SELLERS:

YORKSHIRE ENGINEERING SUPPLIES, LTD.,  
WORTLEY, LEEDS.

Y.E.S. Telephone: 4997 CENTRAL.

## Aeroplane Steel Sheets

as supplied by us to

The Royal Aircraft Factory  
and leading Aeroplane Makers

Guaranteed to comply with the R.A.F. No. 9A specification. Stocked in all gauges. (Sheets are passed and stamped by the A.I.D.)

**BERNARD NICKLIN & CO.**

IRON AND STEEL WAREHOUSE  
SMETHWICK, BIRMINGHAM

Telegraphic Address:  
"Bernico," Birmingham.

Telephone No.:  
224 Smethwick.

## THE POOLE AVIATION CO.

POOLE, DORSET.

Contractors to H.M. Government.

Spares and all Parts of Machines.

ENQUIRIES INVITED.

'Phone: Poole 54.

'Grams: Aviation, Poole

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



## MISCELLANEOUS ADVERTISEMENTS.

**SPECIAL PREPAID RATE: 18 words 1/6; Situations Wanted ONLY, 18 words 1/-; 1d. per word after. TRADE ADVERTISEMENTS in these columns, 3 lines 3/-; 10d. per line after. Public Announcements, Legal Notices, Auctions, Contracts, etc., 16 per line. For the convenience of Advertisers, replies can be received at the offices of "THE AEROPLANE" 166, Piccadilly, London, W.1.**

## PATENTS.

**PAGE & ROWLINSON**, Chartered Patent Agents (Consulting Engineer, Mr. S. E. Page, A.M.Inst.C.E.), 27, Chancery Lane, London, W.C. Tel. 332 Central.

**Henry Skerrett**, Chartered Patent Agent, 24, Temple Row, Birmingham.—Patents, trade marks, and designs.

## SITUATIONS VACANT.

**Fitters** wanted for rudders, fins, elevators, sternposts, under-carriages, spar boxes. Good price given. Day-work or piece-work. No one residing more than ten miles away or already engaged on Government work need apply.—The Swift Aviation Co., Richmond Road, Kingston-on-Thames.

**Wanted, Sheet Metal Workers**, fitters, and turner-fitters, must be first-class men. No one on Government work or residing more than ten miles away need apply to:—Harley Works, Beckton Road, Plaistow, E.16.

**Wanted Foreman** for wood mill; must have had experience in aircraft work. No one on Government work need apply.—Apply to nearest Employment Exchange, mentioning this paper and Box No. 3245.

**Good Engineering Draughtsman** wanted, with some experience of aeronautical work preferred, but not essential. Those on Government work need not apply.—Write, stating experience and salary required to nearest Employment Exchange, mentioning this paper and Box No. 3246.

**Several Good Wiring Hands** wanted. Top wages to really good men. North London district. No one on Government work or residing more than 10 miles away need apply.—Box No. 3251, THE AEROPLANE, 166, Piccadilly, W.1.

**Storekeeper** required, who can read blue prints. Good opportunity for methodical worker. North London district. No one on Government work or residing more than 10 miles away need apply.—Box No. 3250, THE AEROPLANE, 166, Piccadilly, W.1.

**First-class Woodworkers**, including Spindle Machinists, wanted. North London district. Highest wages to first-class men. No one residing more than 10 miles away or on Government work need apply.—Box No. 3249, THE AEROPLANE, 166, Piccadilly, W.1.

**"Guardian Angel" Parachutes.**—Wanted immediately several flying officers with first-class records who have been invalided out of the service, but are now physically fit, to be trained in the assembling and use of these parachutes. Those with a previous engineering experience preferred.—Apply, with full particulars of previous career, to E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, E.C.2.

**Wanted Aeroplane Designer**, with good knowledge of theory and practice to correct courses in aeronautics.—Box 3256, THE AEROPLANE, 166, Piccadilly, W.1.

**Controlled establishment** requires charge hand in aeroplane erecting shop. Only first-class men need apply. Those already on Government work or living more than 10 miles away need not apply.—Box 3253, THE AEROPLANE, 166, Piccadilly, W.1.

**Head Storekeeper** wanted for aircraft works; previous experience preferable. No one on Government work need apply. State age, experience, and salary required. Applications must be made through nearest Employment Exchange, mentioning this paper and Box No. 3260.

**Wanted Junior Draughtsman** for propeller work, with some experience; if male, must be ineligible. State salary required.—Box 3263, THE AEROPLANE, 166, Piccadilly, W.1.

**Wanted, ex-R.F.C. Pilot** to assist in managing flying schools near London, training military pilots. No flying required, but must have had flying experience and be an early riser.—Apply Box No. 3262, THE AEROPLANE, 166, Piccadilly, W.1.

**Draughtsman (engineering)** required for London aeronautical works, preferably with some experience of airship construction, and good knowledge of workshop practice. No one on Government work or residing more than 10 miles away will be engaged.—Apply, stating full particulars and salary required, to W. J. C., Box 3261, THE AEROPLANE, 166, Piccadilly, W.1.

**Foremistress**, for covering and doping room, wanted in the Midlands. Previous experience essential. Preference given to one with knowledge of first aid. No person engaged on Government work will be engaged.—Apply, giving experience, age, and salary required to your nearest Employment Exchange, mentioning this paper and No. A4368.

**Draughtsman** required; must be thoroughly used to aircraft work. No one on Government work or residing more than 10 miles away will be engaged.—Apply personally or write, Super Aviation Co., 154, Dalston Lane, E.8.

## SITUATIONS WANTED.

**Works Manager.**—Aero engine manufacturer is open to offer from progressive firm. Has had first-class experience in manufacture of rotary and stationary engines from laying out of shops, plant, and tool equipment to actually producing in quantities to R.A.F. and Adm. specifications.—Apply to Box 3239, THE AEROPLANE, 166, Piccadilly, W.1.

**Gentleman**, aged 49, discharged from Army last February, requires situation national importance, where knowledge of timber, measurements, calculations, would be useful.—Box No. 3238, THE AEROPLANE, 166, Piccadilly, W.1.

**Chief or Assistant Chief Draughtsman**, several years' experience with one of leading aeroplane and seaplane firms. Good organiser and used to control of men.—Box No. 3247, THE AEROPLANE, 166, Piccadilly, W.1.

**Works Manager or General Foreman** in aircraft works, engineering and sheet metal, good organiser and disciplinarian, thoroughly practical, or would entertain opening of new section and taking small financial interest in old-established firm.—Box 3248, THE AEROPLANE, 166, Piccadilly, W.1.

**Draughtsman**, 23, discharged from Army, 5 years' experience, seeks position; moderate salary.—Write Box No. 3257, THE AEROPLANE, 166, Piccadilly, W.1.

**Chief Clerk or Manager's Assistant** 26 (ineligible), desires responsible post. Good commercial and works office experience. Thoroughly reliable, excellent references, 10 years' ironmongery and engineering trades.—Box No. 3255, THE AEROPLANE, 166, Piccadilly, W.1.

**Assistant to General Manager**, the aeroplane factory, seeks opening as commercial manager or similar position. Acquainted with Air Board routine, and accustomed to handling large volume correspondence respecting contracts, machines and spares. Proving organising ability. General knowledge of all branches. Excellent references. Low salary grade.—Box 3259, THE AEROPLANE, 166, Piccadilly, W.1.

**Experienced Foreman** wants position all round of aeroplane and seaplane fittings, sheet metal work, coppersmithing, welding; good organiser, disciplinarian; used to the handling large numbers of men and women.—Box 3252, THE AEROPLANE, 166, Piccadilly, W.1.

**Experienced Propeller Works Manager** General Foreman desires change. Experienced with all types of propellers.—"A," 42, Wince Road, Raynes Park.

**Works Manager** desires position on municipal work (or ship building); abstainer, and strict business man; used to aeroplane and balloon work; age 40; excellent organiser; practical engineer; pioneer welder; used to handling large contracts and men.—Apply Box No. 3230, THE AEROPLANE, 166, Piccadilly, W.1.

## FOR SALE.

**For Disposal.**—Valuable motor business premises, with two houses and land adjoining situated on main Farnborough and Aldershot road.—For particulars, apply Hollett, Mason and Nash, Solicitors, Aldershot.

**Aeroplane Radiators.**—The Gallay Radiator Company, Limited, stock Aeroplane Radiators. For the benefit of Constructors, can supply radiators for experimental purposes at a nominal cost. Advice given on suitable types for the various approved engines. Our drawing office is always at our clients' disposal.—198, Great Portland Street, London, W.1.

**Testing Machine**, Olsen, tensile and Compression to 50,000 Kgs. perfect condition complete with 2 h.p. motor, cheap, must sell.—Box No. 3228, THE AEROPLANE, 166, Piccadilly, W.1.

## PUBLICATIONS.

**"Military Aeroplanes,"** by G. C. Lodge. Sixth Edition now ready, 21s., post 21s. 6d.—The Wm. Dawson Publishing Co., 2, Breems Bldgs., London, E.C.

## ENGINEERING.

**British School of Aeronautics.**—Air Engineering Course; Aero Design; Aero Construction; Aero Draughtsmanship; Mech Engineering.—Pennington's, 254, Oxford Road, Manchester.



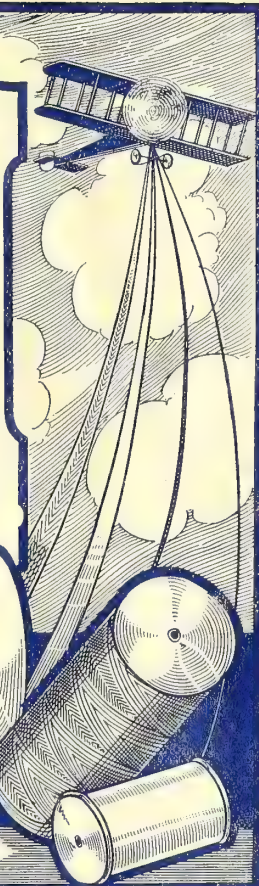
**TAPES  
WEBS  
CORDS  
THREADS  
AIRCRAFT**

ELECTRICAL & MUNITION WORK.

**JOHN MAC LENNAN & Co**

30 Newgate St  
LONDON. E.C.1.

AND AT GLASGOW



## **OXY-ACETYLENE WELDING & CUTTING PLANT**

BLOW PIPES AND ALL WELDING ACCESSORIES  
CARBIDE. FLARELIGHTS. HANDLAMPS



PETROL AND OIL STORAGE TANKS OF ANY CAPACITY.  
STEEL BARRELS, SHEET METAL WORK FOR AIRCRAFT, &C.

**THE  
Acetylene Corporation Ltd.**  
49 VICTORIA ST., WESTMINSTER.

Telegrams:  
"Flamma, Vic, London."

Telephone:  
Victoria 4830.

ACCURACY

**J. H. ROBERTSON & CO**

**AERONAUTICAL ENGINEERS**

Tel. REGENT  
3996

LONDON OFFICE: 1, ALBEMARLE STREET. W.1

*All classes of machining.*

*FINE LIMIT WORK.*

JIGS, GAUGES, AND SPECIAL TOOLS.

TURNBUCKLES, EYEBOLTS A.G.S. SPECIFICATION.

STAMPINGS, AND HIGH-CLASS STEEL FORGINGS,  
PRESS WORK, &c.

OVERHAULING AND REPAIRS TO ALL TYPES OF  
AERO MOTORS.

PROPELLERS FOR ALL TYPES OF AIRCRAFT.

CRANKSHAFTS, PISTONS, GUDGEON PINS, VALVES A SPECIALITY.

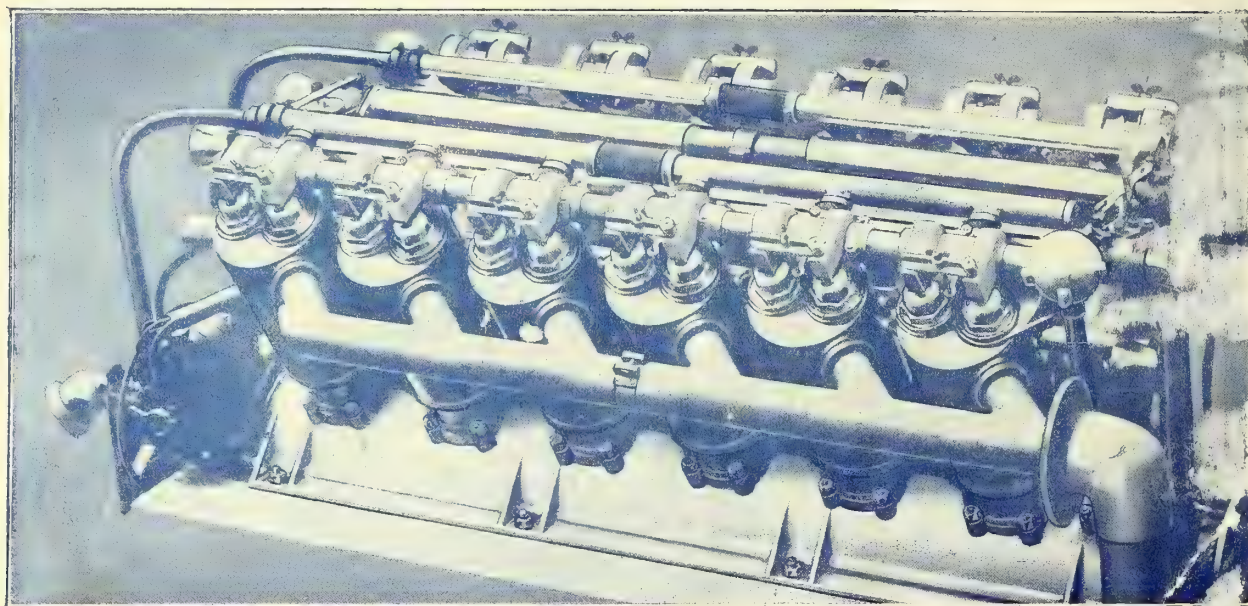
KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# THE GREEN ENGINE

## CO., LTD.

**:: CONTRACTORS TO ::  
H.M. ADMIRALTY  
AND WAR OFFICE.**



12 Cylinder 300 B.H.P. Model.



# 166, PICCADILLY, W.1.

Telegrams: "Airengine, London"

Telephones: Gerrard 8165; Richmond 1293

EDITORIAL AND ADVERTISEMENT OFFICES, 166, PICCADILLY, W.1.

Printed for THE AEROPLANE AND GENERAL PUBLISHING CO., LTD., by BONNER & CO., The Chancery Lane Press, Rolls Passu London, E.C.; and Published by THE WM. DAWSON PUBLISHING COMPANY, LTD., at Rolls House, Breams Buildings, London. Branches in Canada, Toronto, Montreal, and Winnipeg; in South Africa: Cape Town, Johannesburg, and Durban.



# THE AEROPLANE

WEDNESDAY, JAN 16 1918

Edited by  
C. G. G. G.

Vol. XIV, No. 3

THREEPENCE WEEKLY

[Registered at the G.P.O.]  
as a Newspaper.

## THE NORMAN THOMPSON FLIGHT CO. Ltd.

ESTABLISHED 1909

Telegrams—SOARING, BOGNOR  
ENTIFLYTE CHARLES, LONDON

Works—MIDDLETON, BOGNOR

CONTRACTORS TO THE ADMIRALTY

London Office—

Telephones—BOGNOR 42. GERRARD 7385

DEWAR HOUSE, 11, HAYMARKET, S.W.1.

DESIGNERS AND MANUFACTURERS OF FLYING BOATS AND LAND PLANES

**Auster** FOR **Aero-shields**  
LONDON. BIRMINGHAM

**BEARDMORE** AERO  
ENGINES

**TITANINE**  
NON-POISONOUS  
**DOPE**  
SEE ADVERT. INSIDE.

**ACCLES & POLLOCK, LTD.**

WELDLESS STEEL TUBES — OLDBURY, BIRMINGHAM.

**TRIPLEX** Safety **GLASS**

See Advt. inside



. THE .  
**ENGINEERING TIMBER CO. Ltd.**

11, Victoria Street, London, S.W.1.

J. E. HUSON, Managing Director.

Telephone: Victoria—5078, 4219

Telegrams: Entikosil, Vle. London.

**SILVER SPRUCE**

**ASH**

**WEST VIRGINIAN SPRUCE**

**WALNUT**

**MAHOGANY**

**GLASGOW:**

**67, HOPE STREET.**

Telephone: Central 3273.

Telegraphic Address: Entikosil, Glasgow.

**PARIS AGENCY:**

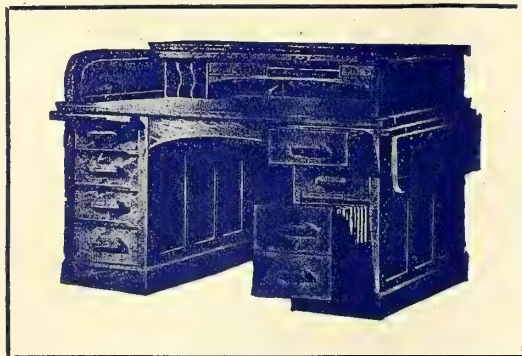
**5, RUE NOUVELLE, PARIS.**

# Factory & Office Furniture

LARGEST STOCK FOR **IMMEDIATE** DELIVERY.

(NEW AND SECOND-HAND)

SPECIALITÉ



SAFES.

**COOKE'S (FINSBURY) LTD.**

INCORPORATING

The FINSBURY OFFICE  
FURNISHING Coy.

&

J. W. COOKE  
& Coy.

**FINSBURY PAVEMENT HOUSE, LONDON, E.C.2.**

Telephones: LONDON WALL } 6179.  
573.

See Telephone Book relating to our Shopfitting, Signs and other Departments.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# EMAILLITE

NON-POISONOUS

**AEROPLANE DOPE.**

*THE ORIGINAL AND STILL THE PREMIER.*

AS  
TIGHT



*Trade Mark.*

AS  
A DRUM.

**THE BRITISH EMAILLITE CO., LTD.,**  
*Contractors to the Air Board.*

Registered Offices:

**30, Regent Street, Piccadilly, S.W.1.**

Wire—"Ridleyppren, Piccy, London."

" Phone—280 Gerrard

Works

**5, Hythe Road, Cumberland Park,  
Willesden Junction, N.W.10.**

Telephone—Willesden 2346 & 2347.

Metal  
Fittings  
a  
Speciality.

**The Aero Mechanical Co., Ltd.**  
CONTRACTORS TO THE AIR BOARD.  
60-66, ROCHESTER ROW, LONDON, S.W.1.

Managing Directors:  
E. Salomon, J. Fogelson

Telephone:  
Vic. 7570 (3 lines).

Complete Fittings  
and Dies in Stock for  
latest D.H. Machines;  
also most of the Fittings  
for other D.H. Machines  
and Handley-Page.

**Our reputation has been built up by our ability to effect  
deliveries right up to time.**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

The Hollow Structure and Aircraft Co., Ltd., Patent.

## WOOD PROBLEM SOLVED.

# HOLLOW SPARS

And Struts for all types of machines.

Any length, shape or section without joints.

FULL PARTICULARS FROM THE SOLE LICENSEES,

**ROBERT YOUNG'S CONSTRUCTION CO., LTD.,**

AIRCRAFT CONTRACTORS,

CANONBURY WORKS, ESSEX ROAD, LONDON, N.

# ALUMINIUM CASTINGS

OF EVERY DESCRIPTION.

We make a  
Speciality  
of  
Aeronautical  
and  
Automobile  
Work.

We are making many thousands of **Aluminium Die Castings** weekly under the celebrated **Cothlas** process—in many cases **entirely eliminating** machining operations, and we hold the sole manufacturing rights in the British Empire for this process.

Chemical and Physical tests are made on our own premises, and our **Castings**, both **Sand** and **Die**, are produced under the most up-to-date and scientific methods.

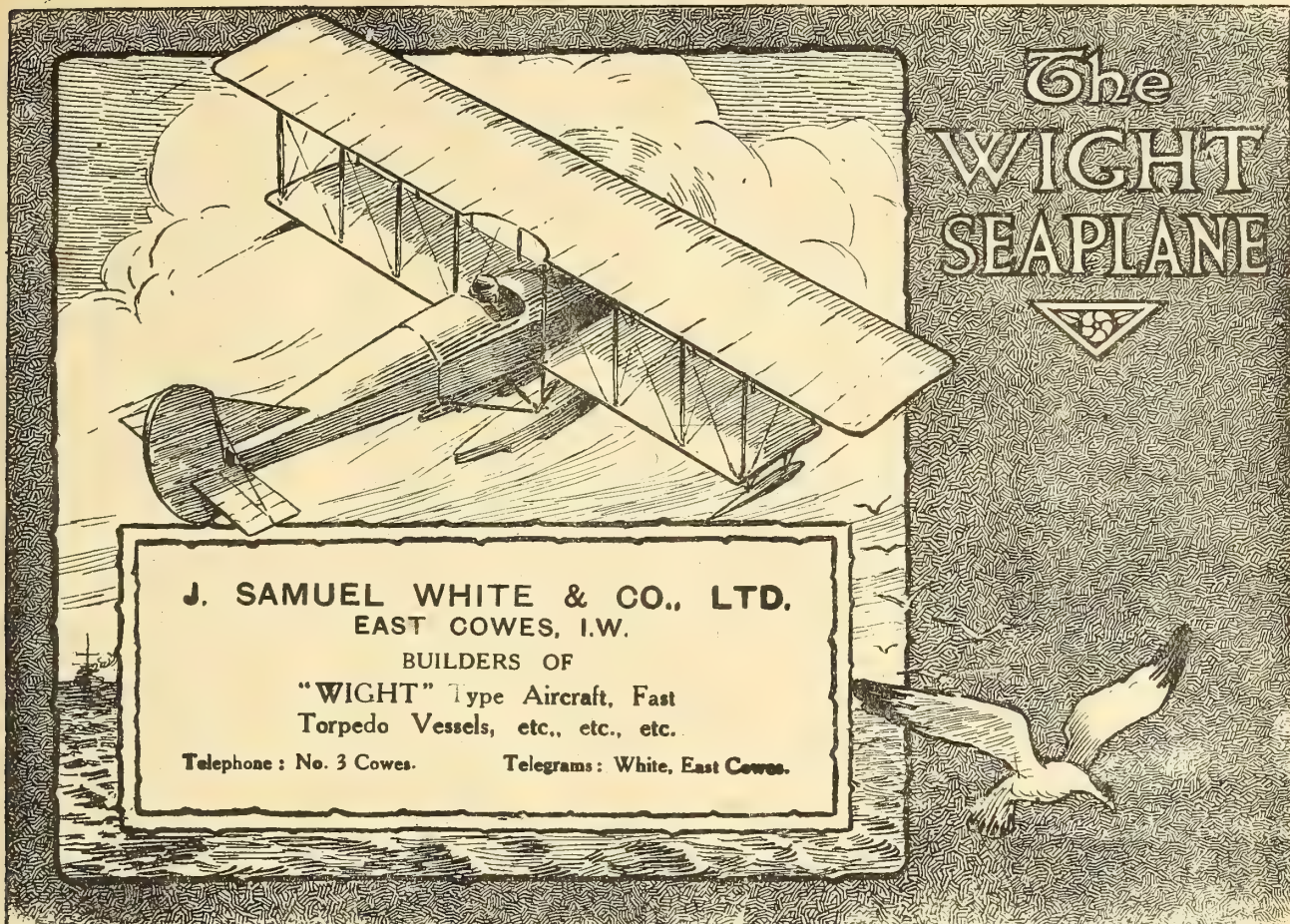
Sole makers of the **Birmal Aluminium Pistons**, thousands of which are running to-day in a highly satisfactory manner under the most severe conditions.

Highest  
Class  
Castings to  
Government  
Specifications.  
Prompt  
Delivery.

**BIRMINGHAM ALUMINIUM CASTING (1903) CO., LD.**

**Cambridge Street Works, BIRMINGHAM.**





**The  
WIGHT  
SEAPLANE**

**J. SAMUEL WHITE & CO., LTD.**  
EAST COWES, I.W.  
BUILDERS OF  
"WIGHT" Type Aircraft, Fast  
Torpedo Vessels, etc., etc., etc.  
Telephone : No. 3 Cowes.      Telegrams : White, East Cowes.

# WARING & GILLOW LTD

**CONTRACTORS  
TO THE  
WAR OFFICE AND ADMIRALTY.**

**LIVERPOOL      HAMMERSMITH      LANCASTER**



**HEAD OFFICE  
OXFORD STREET  
W.1**

**TELEPHONE No. :  
HAMMERSMITH 1980**

**TELEGRAMS :  
"Warings Factories, Hammersmith."**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



WE CAN DELIVER

# A.G.S. Shackles 158

Sizes A and B ————— In any

## QUANTITIES AT ONCE

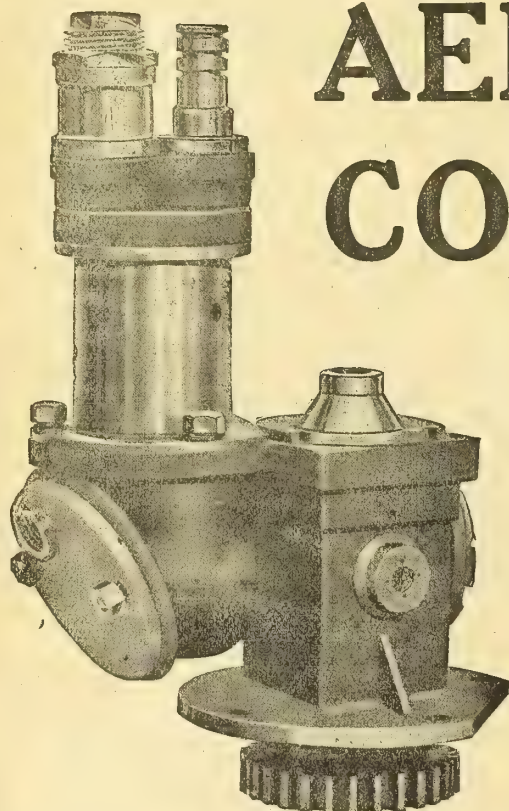
:: :: The ACTUAL Manufacturers :: ::

### The British Gold Shell Ring Co. Ltd.

HOUNSLOW, MIDDLESEX.

— Telegraphic Address —  
"GOLSHEL, HOUNSLOW."

— Telephone —  
HOUNSLOW 254



# AERO ENGINE COMPONENTS

MANUFACTURED BY THE

## SELSDON

**Aero and Engineering Co.  
Limited**

IMPERIAL HOUSE,  
KINGSWAY, W.C. 2.



**A.G.S. WASHERS**

Turn Buttons.

Eyelets.

Washers.

Wire  
Work.**THIMBLES****UNION NUTS & NIPPLES.****W. H. BRISCOE & Co., Ltd.,**

51, 52, 53, PARK STREET,

BIRMINGHAM.

Tel.: 550 Central

Tel. Ad.: BRISK, BHAM.

**R. F. & F. W. BROWN**

(F. W. BROWN.)

Wollaton Saw Mills  
Near Nottingham.**ENGLISH ASH FOR AEROPLANES**  
**Bent Timber Manufacturers.**

Telephone .. 1526 Nottingham.

Telegrams .. Browns, Sawmills, Wollaton.

**THE AIRCRAFT CONSTRUCTION CO.**

EVERY DESCRIPTION OF METAL COMPONENTS.

IMMEDIATE  
DELIVERY OF **SE5 SUMPS, part 11612-1****HARLEY AEROPLANE WORKS, Beckton Rd., E.16**

Telegrams: "Aercracons," Canning, London.

'Phone: East 1300.

**"NOVELLON" DOPE****AND AEROPLANE VARNISH.****CELLULOSE ACETATE & CHEMICALS****BRITISH CELLULOSE & CHEMICAL MANF'G.****COMPANY, LIMITED.**

Telegrams:

Cellutate, London.

8, WATERLOO PLACE, S.W.1.

'Phone: Regent 4045.

Works: Spondon, Derby; and Maybury Gardens, High Road, Willesden Green, N.W.10.

(Telephone: Willesden 2380.)



**Bowden Wire Ltd.**  
**London**  
 VICTORIA ROAD  
 WILLESDEN JUNCTION  
 N.W. 10

THE varied uses and adaptations of Bowden Wire mechanism are recognised by almost every department of State Service. The war work which we have in hand for Home and Allied Governments precludes for the present our acceptance of private orders.

*Established 1897.*

**Alardux**

Alardux is the New Aluminium Flux

A Welding Flux of exceptional merit

May we send you a sample?

The Alardux Co.,  
 23, Fleet Street,  
 London, E.C.4.

City 866.

**THE  
 BRITISH WRIGHT  
 CO. LTD.**

Owners of the British, Italian and Belgian Patents  
 of Wilbur and Orville Wright.

*Manufacturers of*  
**AERONAUTICAL  
 INSTRUMENTS**  
 FOR  
 NAVY & ARMY AEROPLANES

**Ogilvie Air Speed Indicators**  
 for use on Aeroplanes, Airships, Kites  
 Balloons and Air Stations.

**Statoscopes.**  
**Recording Manometers.**  
**Wind Speed Recorders.**

At present the Government is taking the entire output, but  
 British and Foreign firms are invited to place their orders  
 now for delivery of Aeronautical Instruments after the War.

**The BRITISH WRIGHT Co. Ltd.**  
 33, CHANCERY LANE, LONDON, W.C.2.

KINDLY MENTION "THE AEROPLANE"

**LEARN TO FLY**

— AT —

**Bournemouth.**

— THE —

**LARGEST AND MOST UP-TO-DATE  
 CIVILIAN SCHOOL IN ENGLAND.**

*Immediate Vacancies.*

*Run under Rules approved by the Royal Aero Club.*

**RAPID TUITION.**

43 Caudron Service Biplanes (Solo & Dual Control).

**SPECIAL TRAINING**

for Pupils intending to enter the R.F.C. or R.N.A.S.

**APPLY:**

**Bournemouth Aviation Co., Ltd.,**  
 AERODROME, BOURNEMOUTH. (Phone 1160).

WHEN CORRESPONDING WITH ADVERTISERS.



# Aircraft Fittings.

## GABRIEL & CO.

**Manufacturers of  
AEROPLANE FITTINGS in BRASS,  
COPPER, GUN METAL, BRONZE  
AND CLARUS ALUMINIUM.**

Castings supplied either Machined complete or in the rough.

Sheet Metal Work in Brass, Copper, Steel, Tin, or Aluminium, including Spinings, Stampings and Pressings.

**A.G.S. FLANGES, PETROL FILTERS, ETC.**

Tube Bending and Capstan Work a speciality.

**Contractors to Admiralty, War Office,  
Ministry of Munitions, H.M. Air Board,  
Royal Aircraft Factory and Crown  
Agents for the Colonies.**

TEL. ADDRESS:  
GABRIEL, BIRMINGHAM  
TELEPHONE:  
CENTRAL 1223.

**4 & 5, A. B. ROW,  
BIRMINGHAM**

# HIGH-CLASS ALUMINIUM CASTINGS

FOR ALL TRADES.

We Specialise in Aluminium Cylinders and General Aero and Motor Engine Castings,

## CAST IRON CYLINDERS

Water and Air-cooled for Aero & Motor Engines

ALL THE ABOVE CASTINGS  
TO GOVERNMENT SPECIFICATION.

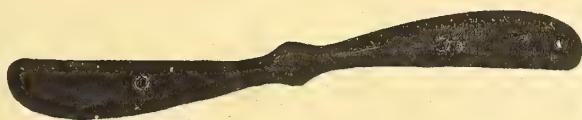
**WILLIAM MILLS, LTD.,**

Atlas Works :: Grove Street,

**BIRMINGHAM.**

ALUMINIUM AND IRON FOUNDERS.

# CHAUVIÈRE'S Integral Propellers



are used more extensively than  
any other Propeller in  
the World.

**Hold all Records and are  
indisputably the best.**

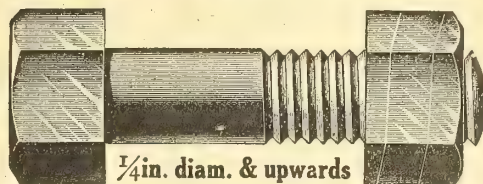
**Maximum Efficiency.  
Best Workmanship.**

**THE INTEGRAL PROPELLER CO., LTD.**

Edgware Road, The Hyde, Hendon, N.W.9.

Telegrams: "Aviprop, Hyde, London." Telephone Kingsbury 104.

# BRIGHT BOLTS & NUTS



(Suitable for Every Description of Engineering Work)  
**QUALITY, ACCURACY AND FINISH GUARANTEED**

**THE  
"HELICOID" LOCK-NUT**  
(THE FINEST LOCK-NUT IN THE WORLD.)

This nut will remain secure, no matter how great the vibration may be—in fact vibration actually tightens the grip.

(made from 1/4 in.  
to 2 1/2 in.)



(sample nut & prices  
on application)

We also manufacture Wrought Iron Railing and Gates, etc.

**BAYLISS, JONES & BAYLISS,  
WOLVERHAMPTON.**

London Offices: 139/141, CANNON ST., E.C.4.

# PROPELLERS ONLY.



**CONTRACTORS TO  
H.M. GOVERNMENT**



Office & Works—  
Propeller Works,  
Balm Road,  
Hunslet,  
Leeds.

Telephone—  
Central 291.  
Telegrams—  
Airscrews, Leeds.

Contractors to H.M. Government.

# SWIFT AVIATION CO.

Dolphin Engine Plates in Stock,  
Complete Sets.

*Speciality Sopwith Spares.*

# KINGSTON

PHONE—  
762 KINGSTON

'GRAMS—  
"SWIFT, KINGSTON"

Wires—"Carbon," Cambs

'Phone—Cambs. 5 & 1086.

# Y?

Do you stop to look at this?—Because you have a keen sense of INTEREST. —We feel sure, then, that you will be interested in the progress & exceptional facilities offered to civilians and prospective R.N.A.S. and R.F.C. applicants

BY THE

## CAMBRIDGE SCHOOL OF FLYING AND AERODROME Co., Ltd.

Enquiries to—

30b, ST. ANDREWS STREET, CAMBRIDGE.

CONTRACTORS TO H.M. GOVERNMENT

# W.T. CLARK & CO.

Telephone  
No.  
Central  
2121.

5, GREEN TERRACE,  
ROSEBERY AVENUE,  
LONDON, E.C.1.

Telegrams  
Etalspinne  
Ising London  
Two Words

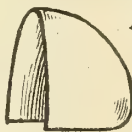
## METAL SPINNERS and

## SHEET METAL WORKERS for Aeroplane Constructors

### METAL SPINNINGS for AEROPLANES

Cowlings (COMPLETE SET)  
Coverings  
Undershields

Fairings  
Petrol Tanks  
Shields etc.

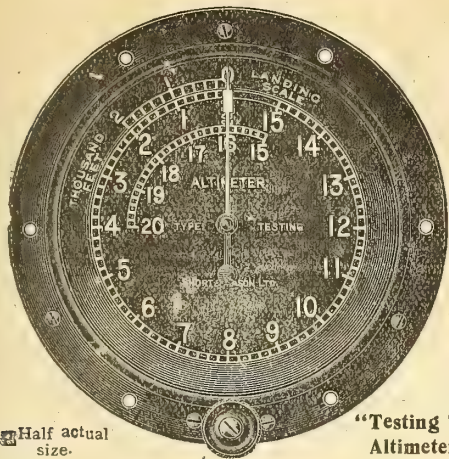


BEATEN COWLS  
OF EVERY  
DESCRIPTION

SPUN COWLS  
UP TO  
48 INCHES  
IN DIAMETER.







Half actual size.

"Testing Type" Altimeter.

# ALTIMETERS

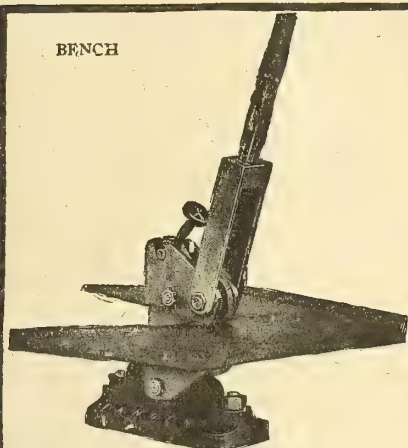
FOR

## AIRCRAFT

MANUFACTURED BY

### SHORT & MASON LTD.

Aneroid Works, WALTHAMSTOW, E.17.



BENCH

## TANGENT SHEET METAL SHEARING APPLIANCES

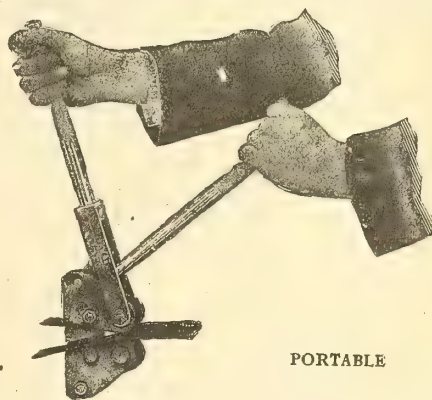
PATENT

Self - Feeding. Fast - Cutting.

Blocks illustrate a combined portable and bench tool for sheets up to 3/32" steel, and 1/8" softer metals.

Other types also made, including portable hand tools for Corrugated Iron.

WRITE FOR DESCRIPTIVE PAMPHLET  
MONTGOMERY, SMITH & CO. LTD.  
Patentees and Manufacturers,  
TANGENT WORKS, KEYNSHAM, SOMERSET.



PORTABLE

We make  
a  
Speciality  
of every  
Description

## NAME & ADDRESS PLATES

IN IVORY · IVORINE · BRASS  
GERMAN SILVER · COPPER  
TABLETS FOR ALL PURPOSES  
Prompt Delivery Guaranteed  
ENDOLITHIC MFG. & LTD

6 1/2 Fore Street  
LONDON E.C.

of Plates,  
Gauges and  
Dials for  
Aeroplanes,  
etc., etc.

Write for our "A" List.

# PLYWOOD

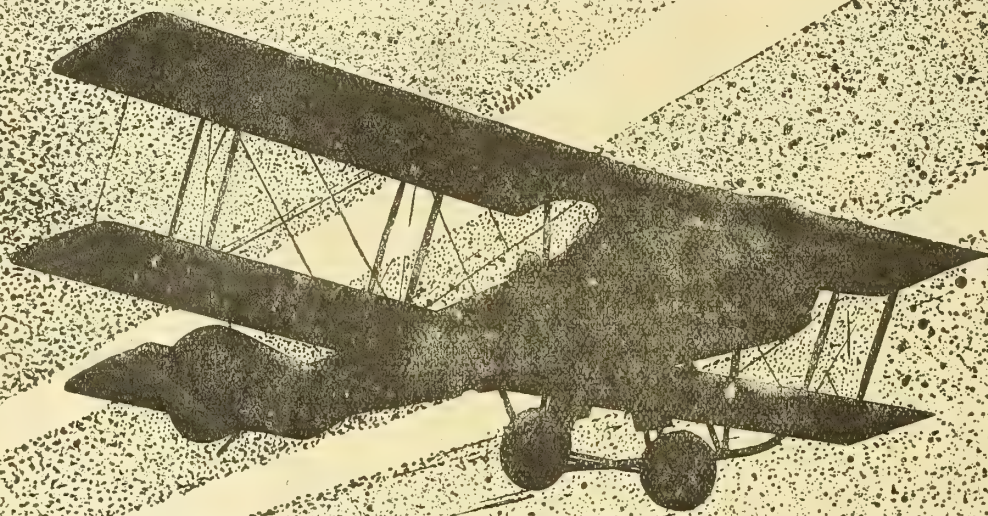
In all Thicknesses and Qualities.

**SIBERIAN & GENERAL TRADING CO., Ltd.,**  
1-3, Leonard Street, City Road, LONDON, E.C.2.

Telegraphic Address: "Wolosey, Finsquare, London." Telephone: London Wall 3577.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





# AVRO

## NOTHING BETTER

### AVROE & CO. LTD.

TELEGRAMS  
TRIPLANE

MANCHESTER

TELEPHONE  
CITY 5339



# The AEROPLANE

The Editorial and Advertising Offices of "The Aeroplane" are at 166, Piccadilly, London, W.1.  
 Telegraphic Address: "Aileron, London." Telephone: Mayfair, 5407.  
 Accounts, and all correspondence relating thereto, should be sent to the Registered Offices of  
 The Aeroplane and General Publishing Co., Ltd., Rolls House, Breams Buildings, E.C.4.  
 Subscription Rates, post free: Home, 3 months, 8s. 10d. 6 months, 7s. 7d.; 12 months, 15s. 2d.  
 Foreign, 3 months, 9s. 0d.; 6 months, 10s. 0d.; 12 months, 20s. 0d. Canada, 1 Year, \$4.70c.  
 U.S.A., 1 Year, \$5.20c.

## ON EXPECTATIONS AND ANTICIPATIONS.

Probably the most ill-used word in the English language is "anticipation." Every journalistic hack, with his alleged "modern side" education, every business man and scientist, whose schoolmasters scorned Latinity, writes or talks of anticipating when he merely means expecting. The difference is important. So important in fact that it accounts for most of the trouble in which this country now finds itself.

One may expect an event without doing anything to prepare for it. But to anticipate an event means to expect it and take definite steps accordingly beforehand. Most people possessing ordinary sense expected the present war. But those who misgoverned the nation did nothing to anticipate it.

Anticipation of the war would have meant conscription in 1900 A.D., and a trained Army of four or five millions by 1914. Anticipation of the war would have meant an active Naval War Staff by 1905, and an adequate Submarine Service by 1910. Anticipation of the war would have meant encouragement of private aeronautical experiments in 1909, and a Flying Corps of 50 squadrons, instead of 5, in 1914. Also, anticipation of the war would have meant by 1910 the establishment of a War Office, with a complete War Staff to control the King's Sea, Land, and Air Forces, together—a method of making war which has not yet dawned on those responsible for the welfare of this country. As it was, we just expected the war, and were not disappointed.

To put the point on a lower plane, for the benefit of those not interested in war as a profession, if an employee expects a rise in his wages it can do him no harm. In the result he is either pleased or disappointed. But if he anticipates a rise in his wages, he either finds himself in debt when the rise is granted, or finds the brokers in when it is not granted.

Or, to put the matter more clearly still, if one merely expects a punch in the jaw, one probably gets it: whereas, if one anticipates a punch in the jaw it is the other fellow's jaw which gets it, instead of one's own. I trust that this *argumentum ad hominem* will make the distinction clear.

### WAR AIMS.

Now, one imagines that most people in this country would prefer to win this war rather than to lose it. There may be a few genuine Bolos, who want the British Isles to be conquered and want the British Empire to disintegrate. There may be still more Bolsheviks, who are fools enough to believe that such a thing as a Democratic-World-Peace (beautiful German portmanteau word) is possible, though anyone who knows human nature knows that such an idiot peace could be broken in a few months by any born leader of men. I would back any really clever fighting man to work up a sanguinary war between Manchester and Liverpool on the shipping

question, or between the Woodworkers and the Metalworkers on the piecework question, if he tried in earnest.

Nevertheless, it is fairly certain that most people would resent a German government in this country, even though it would certainly be more efficient than our own and might get more work out of the British workman—for less pay, *bien entendu*. There seems no reasonable alternative between our winning the war and Germany winning the war. Therefore it seems that either we must make up our minds to beat Germany, or we must be prepared to be governed by Germany. The British People are at liberty to choose.

Assuming, then, that the British People do not want to be governed by Wilhelm II., von Hindenburg, von Ludendorff, von Kühlmann, and company, it seems that our aim and object in life must be to beat the Hun. Lord Lansdowne may write till he contracts writer's cramp, Mr. Lloyd George and President Wilson may speechify themselves hoarse with high-falutin' nonsense and compromising proposals about "war aims" and "terms of peace," but at the finish the only war aim that matters is the beating of Germany, and the only terms of peace which are worth having are those which the British Empire and her Allies dictate. Anything less means that we are beaten. Which is it to be?

Are we to win the war on paper, via Lansdowne, George, Wilson, and Co., Unlimited, and consent to peace plus disarmament—so that Western Europe will become a lamb ready for slaughter by the Slav and Mongol Empires of the future? Or are we to win by our own strength, with the help of the British Army, and become, after we have made a just and perhaps generous peace with a brave if brutal enemy, a military nation ready armed against whatever the future may bring? If one cannot have the latter alternative, perhaps even a German government would be preferable to the former ghastly farce.

One would like to see the effect on the British workman of a serious statement that either the Trades Unions must give up their millions of slackers between 19 and 25 years of age to the Army, or the Government will chuck up the sponge and invite the Germans to come over here and run the country as it will deserve to be run if the people have not the pluck to fight for it.

If we are to succeed in our war aims and dictate our own peace terms, we can only do so by anticipating the enemy's warlike actions. It is no use sitting down and expecting that the Hun will do certain things. Our only hope is to anticipate him at his own game. This paper being concerned primarily with aircraft, one proposes hereafter to suggest certain possible anticipations.

### THE FIRST ANTICIPATION.

The first warning of what to expect in the air war of 1918, and how to anticipate it, comes, as it did last year, from Sir Douglas Haig. Here are his words:—



"The enemy, however, shows no sign of relaxing his efforts in this department of war. While acknowledging, therefore, most fully the great effort that has been made to meet the ever-increasing demands of this most important Service, I feel it my duty to point out once more that the position which has been won by the skill, courage, and devotion of our pilots can only be maintained by a liberal supply of the most efficient machines."

There you have the expectation and the proper anticipation put clearly in plain, soldierly language. It is practically a repetition of what Sir Douglas Haig said last year, with the important difference that he then referred to the "maintenance of the mastery in the air," rather as something still to be attained, whereas now he refers to the maintenance of "the position which has been won." The difference in phrasing is encouraging, and may be taken as indicating the improvement in the aerial position during 1917.

Enthusiasts for aviation—mostly inspired thereto by the bomb raids of the past year—would doubtless have it that an overwhelming air fleet will win the war. Those of us who, besides our enthusiasm for aviation, have made some study of war as a science and an art, have no such illusions. A great air fleet is merely a necessary part of our whole scheme of defence, and none knows yet what size that air fleet ought to be in proportion to our army and our sea fleet in order to achieve the maximum efficiency all round. It is, however, certain that big as are our present Flying Services, they are far too small to do the work which lies before them in the present year. Therefore, the task of our brand new Air Council is to anticipate the demand of the Senior Services for aircraft, and not merely to expect it.

#### THE TASK OF THE AIR COUNCIL.

An important point worthy of the attention of the Air Council is that from the very beginning of the war British aeroplane designers have anticipated Germany's best designs. If we had ever had a decent aero-engine prior to 1916, our single-seater and two-seater machines would have been more than a match for Germany's best. Even as it was, our best aeroplanes with low-powered engines were better than Germany's best with bigger engines.

The fact that the Germans anticipated us by putting into the air at the Front a large number of machines which were superior to our average machines was solely due to the muddle-headed way in which our supplies have been handled. That is to say, our "trade" designers always anticipated Germany's best efforts by at least six months, and the German military authorities anticipated our Naval and Military authorities by about twelve months.

The position which has been won—as Sir Douglas Haig said—during the past twelve months, by the skill, courage, and devotion of our pilots, has been made attainable by improvements effected in the supply departments during 1917 by Lord Cowdray and Sir William Weir. The task of the new Air Council is to extend those improvements, and it is fairly well known to everybody in the Aircraft Industry where those improvements are most needed, but perhaps it may be well to indicate the directions more clearly, so that it will be possible in the future to refer back and see whether Lord Rothermere has really touched the bad spots or not.

#### WHERE IMPROVEMENTS ARE NEEDED.

It is well known, of course, that there has been a general clearing out in the Technical Department, but it is not yet known whether all the minor departments of that department have yet been properly swept. Perhaps, therefore, it may be better to assume that none of the minor officials have received their desserts, and simply

point out where improvements were needed before Lord Rothermere started his "push and go" campaign.

Primarily, all departments dealing with material needed cleaning out, except perhaps those dealing with metals. Steel and other metals seem to have been well handled. On the other hand, the timber question has been grossly mishandled. The waste of timber, through insisting on the best material being used in school machines, and the refusal to permit the use of substitutes in parts where strength does not much matter, has been simply lamentable.

Similarly the fabric question has been handled in a way which almost forces one to think that someone or other must have an interest in the linen trade. Cotton, and other materials still more easily available, ought to have been substituted for linen nearly a year ago. The type of linen used ought to have been altered. The linen supply question ought to have been smoothed out, instead of being troubled by strikes. In fact, the whole series of officials who have had to do with the fabric and timber questions, from top to bottom, seem to have done just about as badly as it is possible to do anything. Ignorance, bigotry, and obstinacy seem to have been the watchwords of those departments. And, be it remembered, no question of Service training or Service routine has been involved, for all these precious "experts" are merely civilians in uniform. None of them are sailors or soldiers.

The propeller—or airscrew—departments have been just about as bad. Tons of valuable timber have been wasted. The use of easily-obtained substitutes has been prohibited. No encouragement has been given to people with new ideas on propeller design and construction. In fact, improvements in economy and efficiency have been systematically damned and dammed.

The dope question, and the glue question, the oxygen question, and the chemical question, generally seem to have been nearly as badly handled as matters concerning timber and fabric. Doubtless if one had time to go into details concerning other departments where "experts" are employed, one could find equal need for reform.

#### THE CURSE OF THE EXPERT.

However, Lord Rothermere and the Air Council may take it as a general rule that wherever a department is run by an "expert" who sets up to be a scientist that department has been a hindrance to the supply of aircraft for the Services, simply because these experts spend so much time messing about with details and fiddling around with intricate calculations and fooling with microscopes and slide-rules and such things, that they are incapable of taking a broad view of a practical question. The mere practical mechanic, such as one finds in an aircraft factory or an airscrew factory, invariably arrives at better results in half the time.

It is all very well to have a few cages full of experts, to whom one can push a problem through the bars and tell them to go and play with it, and hand out what they think is the answer when they have done with it, but it is homicidal to let these experts have any authority. Imagine, for example, an Aircraft Supply Depot run by the National Physical Laboratory.

Look at the actual results obtained from the R.A.F. "experts." Look at the latest S.E. machines, for example. Quite good performers, quite decent fighting machines, but simply off the map as a factory production proposition. Any capable aeroplane designer could produce a machine aerodynamically identical with the S.E.—and possibly much better—at half the cost of labour and material and very considerably lighter. Like all "experts" aeroplanes, the whole thing has obviously been produced synthetically out of a laboratory instead



of springing parthenogenetically from the brain of a born designer.

The result is a lot of scientifically excellent component parts, more or less decently put together, instead of one complete homogeneous aeroplane. It is probably none the worse as a fighting machine, but it is not calculated to use our sources of supply to the best advantage, and so maintain that liberal supply of the most efficient machines which Sir Douglas Haig and the Chief of the Air Staff require.

#### THE NEW POLICY.

The policy of the Air Council, following Sir William Weir's policy of 1917, seems to be to encourage "trade" designers more and more, so that there is not much to fear from "experts" as actual designers in the future. I merely quote the above instance as an example of what happens in minor details. Also, the Design Department of the Technical Department could not be in more capable hands, and the "trade" designers all know that the designs which they submit are judged by men of great experience both of aeroplane work and of active service.

Furthermore, active service pilots who are not in touch with what is going on at home may rest assured that the new designs which are coming through, both in engines and aeroplanes, are far in front of anything yet seen. The Huns' best possible designs are being anticipated.

It is well to remember that the Hun never originates anything. He merely cribs and perfects laboriously what someone else has shown him. The only reason why his aeroplanes have been, on the average, better than ours on active service has been that he has been quicker to produce in quantities the aeroplanes which he has cribbed from us. Under the new policy it seems likely that we shall be as quick in putting our new designs into quantity-production as the Hun has been.

If we can do this it will mean that the bulk of our machines at the front will be as far in front of the bulk of the Huns' machines as our best new machines at home have always been in front of the best Hun machines. But, in order to attain that quickness between first design and quantity-production, other big changes must be brought about.

*(To be continued.)*

#### THE SEA, LAND, AND AIR FORCES.

It has been stated in the daily Press that Major-General J. M. Salmond, C.M.G., D.S.O., who was appointed Director-General of Military Aeronautics and a member of the Army Council a few months ago, has gone abroad to take the place of a General Officer who has recently returned for duty in England. No official announcement has been made on the subject, but it may be taken that the office of D.G.M.A. has been abolished and no member of the Air Council or of the Staff of the Military branch of the Air Force will have a seat on the Army Council.

Elsewhere it is recorded that the Naval branch of the Air Force is no longer represented on the Board of Admiralty.

Thus we find the new Service dissociated from the two Senior Services at the very moment when the closest co-operation between all three Services is necessary. Doubtless proper channels of communication

between the Air Force and the Land and Sea Forces have been established, but, if the most efficient co-operation is to be achieved, it would seem desirable that the Air Force should be represented on the Board of Admiralty and on the Army Council by actual members with power to vote rather than that it should merely communicate with those bodies on paper, or by means of delegates without direct power to give effect to the recommendations of the Service branches of the Air Council. Or the Army Council and the Admiralty should be represented on the Air Council.

Failing the setting up of a War Council composed of the Chiefs of the Naval, Military, and Air Forces, without political or civilian interference—which would appear to be the ideal body for the conduct of war—one fails to see how any advantage is obtained by the new arrangement, and one foresees possibilities of considerable disadvantage.—C. G. G.



**A MEMORIAL OF GOOD WORK.—THE OLD AIR BOARD.**—At the head of the table, Lord Cowdray (President). On his right, Maj. Baird (Parliamentary Secretary), Commodore Paine, R.N., General Henderson, and Sir William Weir. On his left, Sir Paul Harvey (Secretary), Mr. Percy Martin, and Capt. Groves, R.N.



## THE BOARD OF ADMIRALTY.

The Secretary of the Admiralty announced on Jan. 12th that Letters Patent for the new Board of Admiralty have been issued, and among the appointments and changes therein the following affect Naval Aeronautics:—

Commodore Godfrey Paine, C.B., M.V.O., R.N., Fifth Sea Lord and Director of Air Services, leaves the Board of Admiralty in consequence of the recent creation of the Air Council.

Under the Deputy Chief of Naval Staff will be grouped three Directors whose duties will relate entirely to the planning and direction of operations in the main sphere of Naval activity, viz.:—

Dir. of Operations Division (Home).—Capt. A. D. P. Pound.

Director of Plans Division.—Capt. C. T. H. Fuller, C.M.G., D.S.O.

Director of Air Division.—Wing Capt. F. R. Scarlett, D.S.O.

Thus one sees the relative importance now given to the Air Service.

Under the Assistant Chief of Naval Staff will be grouped four Directors, whose duties relate to Trade Protection and Anti-Submarine Operations, one of whom is

Dir. of Anti-Submarine Division.—Capt. W. W. Fisher, C.B.

It is assumed that the R.N.A.S. will operate largely in association with this officer.

Wing Capt. F. R. Scarlett has been connected with the R.F.C. from its early days, and for some time held the post of Inspecting Capt. of Air Stations. As a Commander he studied at the Military Staff College, in 1913 he qualified for his aviator's certificate, and in May of that year was given the command of H.M.S. "Hermes," a ship detailed for special duties in connection with the Air Service, which was torpedoed early in the war when commanded by Capt. Lambe.

Towards the end of 1913 he was appointed Inspecting Captain of Aircraft. He was promoted to Capt., R.N., on Dec. 31st, 1914, and has since been on active service abroad. He is 40 years of age.

It will be noted that nothing is said about airships. It seems that although the lighter-than-air service is manned by the R.N.A.S. its constructional side is entirely under the Admiralty—anyone who has seen the imitation Zeppelin at close quarters will recognise the fist of the Naval Architect. At any rate, this side has nothing to do with the Air Council, and the matter appears to demand attention on this account.

Further, it will be noted that as Commodore Paine ceases to be a Lord of the Admiralty, there is no direct communication between their august Lordships and naval aviators, which does not increase one's belief in the prospects for this branch of the Air Force, if and when the Admiralty permits the dissolution of the R.N.A.S.—C. G. C.

## AN INSULT TO THE FLYING SERVICES.

The "Daily Mail" has recently excelled itself in its misjudgment of the sentiments of the Flying Services, and in its inability to distinguish between what constitutes an officer and gentleman, and what constitutes a stage star. For some time past the "Mail" has been crying out for the Services to announce the names of our successful Hun-killers in the way that the French and Germans announce theirs, but the Authorities have very properly refused to permit the paper to put our officers on the level of star turns on music-hall bills.

However, last week the "Mail" managed to get hold of the names of three officers who have done good service, and placarded its centre pages with an approximately accurate story of their performances. It also managed to secure their photographs, and decorated its back page with them, placing them in immediate juxtaposition with that of a notorious company-promoter who, after having served a period of imprisonment some years ago, had just been arrested again on a charge of fraudulent dealings.

One gathers that Lord Northcliffe, being officially employed, is unable to attend to journalistic affairs, but one sincerely hopes that some friend of his lordship's will bring this matter to his august attention. One cannot believe that such an act would have been committed by his paper if he had himself been at the helm, and it seems that the occasion is of sufficient importance to

justify him in emerging momentarily from his official position, so that he may administer deserved punishment to the perpetrators of this latest example of caddishness from Carmelite House.

Also, as an official, Lord Northcliffe will do well to consult the Service members of the Air Council on the subject of making "star turns" of flying officers. There are excellent military reasons for keeping the names of successful Hun-killers from publicity.

It is obvious—apart from the natural dislike of an officer and gentleman to being made an object of public entertainment—that the publication of any given pilot's deeds is bad policy, because the capture or death of one of our star turns would cause extreme elation among the enemy's aviators, and would cause a certain amount of depression among our own people. Anonymity among pilots is as sound a military policy as is the concealment of the names of officers commanding in the field, and the concealment of the movements of troops.

This action of the "Daily Mail's" is worse than a lapse from good taste, it is definitely a disservice to the R.F.C., and any such further efforts should be stopped by the Military Censorship.—C. G. C.

## THE AERONAUTICAL SOCIETY.

The quarterly review of the Aeronautical Society of Great Britain, "The Aeronautical Journal," is now published for the period October-December, 1917, at the price of 2s. 6d. The journal contains lengthy reprints of lectures given before the Society, including one on "Commercial Aeronautics," by Mr. G. Holt Thomas, "A Further Three Years' Flying Experience," by Capt. B. C. Hucks, "The Training of Aeronautical Engineers," by Dr. R. Mullineux Walmsley, F.R.S.E., and Mr. C. E. Larard, M.I.C.E., M.I.M.E., and an account of the Wilbur Wright Memorial lecture for 1917 delivered by Lt.-Col. Mervyn O'Gorman, C.B. Those who require a copy of the Journal are invited to apply to the Secretary of the Society, Mr. W. Barnard Faraday, LL.B., F.S.S., at 7, Albemarle Street, Piccadilly, W.1.

After the January issue the journal will be published monthly instead of quarterly and the price will be increased from 1s. 6d. to 2s. 6d. Those who wish to obtain the journal regularly can have it sent post free for an annual subscription of 30s. It is well, however, to point out that anyone really interested in aeronautics can become an Associate Member of the Society for a guinea a year, and Associate Membership includes a free copy of the journal. Therefore, it is considerably cheaper to become an Associate Member than to be merely a subscriber to the journal.

Appropos the Aeronautical Society it is amusing to note that the "Daily Mail Year Book," which sets out to be an authority on all things in Heaven above, on the Earth beneath, and in the Waters under the earth, in its list of "learned societies" for 1918 omits entirely the name of the Aeronautical Society, which is the oldest learned Aeronautical Society in the world, and includes a concern calling itself the Aeronautical Institute—the name of which is probably known to readers of this paper already.

It is also amusing to notice that a weekly publication which deals entirely with aeronautical affairs, albeit not always with the strictest accuracy, in giving the list of the members of the Air Inventions Committee, has apparently taken the list of names from the daily press, and, with true journalistic inaccuracy, has given the name of the distinguished Chairman of the Aeronautical Society as General Luck, under which title the name of General Ruck is very successfully camouflaged. In view of the number of distinguished persons intimately connected with the Air Board, who are interested in the said publication, one cannot help being somewhat surprised at such an egregious error.

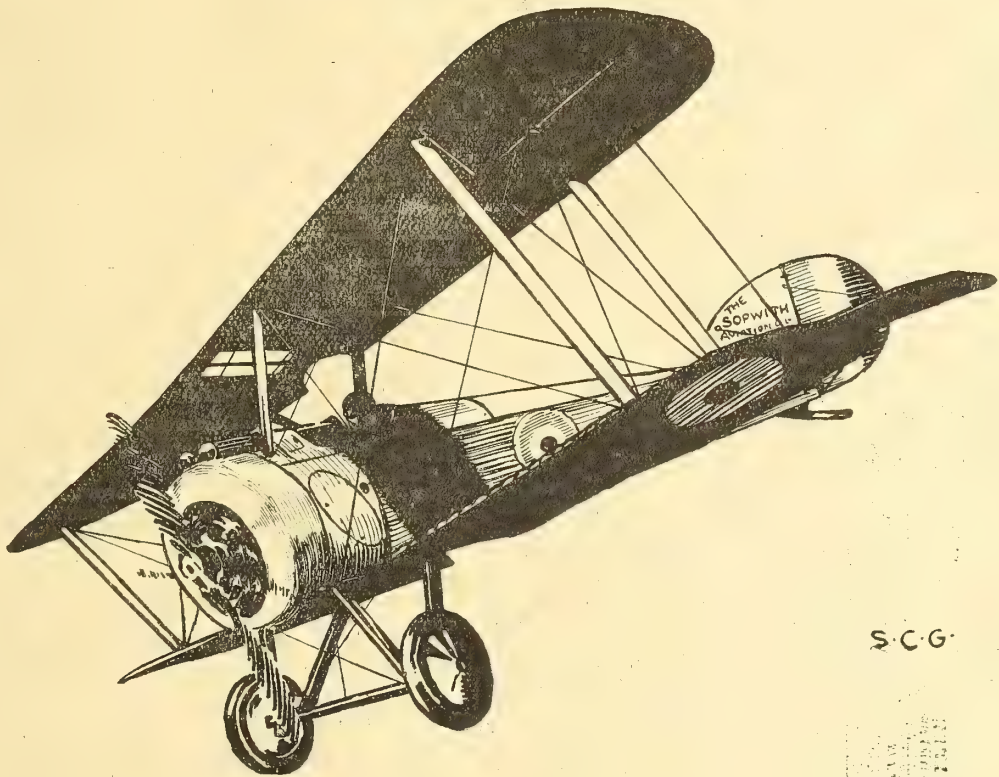
Lieut.-General Sir David Henderson, K.C.B., D.S.O., who has now been appointed Vice-President of the New Air Council, and who rendered such distinguished services as Director-General of Military Aeronautics, has been elected an Honorary Fellow of the Aeronautical Society of Great Britain as a recognition of his distinguished services to aeronautics, and of his many years' work on behalf of the Society.

General Henderson, who has accepted the fellowship, has been a member of the Aeronautical Society for seven years.

In consequence of the increasing stringency of the paper regulations it is necessary to restrict the circulation of THE AEROPLANE to actual orders. Will readers please note that, beginning with the issue dated Jan. 23rd, there will be no copies available for chance customers of newsagents. Definite orders in advance should be given to a newsagent, or subscriptions for three, six, or twelve months should be sent direct to the publishers—The Wm. Dawson Publishing Co., Ltd., 2, Breems Buildings, E.C.4. Disappointment is otherwise inevitable as the number printed will be determined by the number ordered by readers.



# THE SOPWITH



**AVIATION COMPANY, LIMITED**  
**KINGSTON-ON-THAMES, ENGLAND.**  
**CONTRACTORS TO H.M. GOVERNMENT.**

Telephone: KINGSTON 1988 (8 lines).  
Telegrams: SOPWITH, KINGSTON:

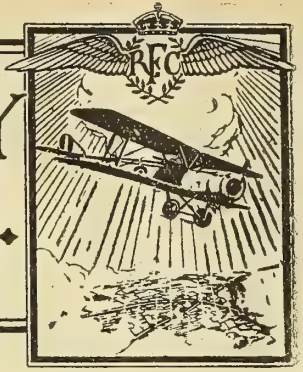


Paris Office :  
21, RUE DU MONT THABOR.





# NAVAL *and* MILITARY • AERONAUTICS •



## FROM THE "LONDON GAZETTE."

ADMIRALTY, Dec. 31st, 1917.

JAN. 5th.—Temp. Flt. Lt. W. H. Wood, who relinquished his appt. on account of ill-health contracted in the Service, to retain his rank, Dec. 18th, 1917.

ST. JAMES'S PALACE, Jan. 1st.

The King has been pleased to confer the Medal of the Most Excellent Order of the British Empire upon the following for services in connection with the war.  
SYKES, HERBERT.

For courage in testing aircraft in spite of severe accidents.

WAR OFFICE, Jan. 8th.

REGULAR FORCES—ESTABLISHMENTS.—R.F.C.—MIL. WING.—Special Appt.—(Graded as a Wing Comdr.)—Capt. (temp. Maj.) H. L. Cooper, Spec. Res., a Sqdn. Comdr., and to be temp. Lt.-Col. whilst so empld., Nov. 1st, 1917.

Adjts.—Temp. Capt. P. N. Logan, attd. Glouc. R., from a Flying Officer and to be transfd. to R.F.C. Gen. List, vice temp. Capt. E. N. E. Waldron, Gen. List, Oct. 28th, 1917. Temp. Lt. S. C. Godfrey, M.C., R. Sc. Fus., and to be temp. Capt. (with pay and allowances as Lt.) whilst so empld., Oct. 30th, 1917. Temp. Lt. H. W. Guy, Gen. List, from a Flying Officer (Obsr.), and to be temp. Capt. (with pay and allowances as Lt.) whilst so empld., vice Capt. C. G. Beatson, Midd'x R., Spec. Res., Nov. 5th, 1917.

GEN. LIST.—Temp. Serjt.-Maj. G. J. Lusted, from R.F.C., to be temp. Sec. Lt., Dec. 24th, 1917.

To be temp. Capts. (without the pay or allowances of that rank) whilst empld. as actg. Adjts.:—Temp. Lt. A. Le. P. Jones, Hamps R.; Temp. Lt. A. Broomer, Gen. List, a Flying Officer (Obsr.); Lt. H. W. Eaton, R. Scots. T.F.; Sec. Lt. J. F. Woodthorpe, Norf. R.; Temp. Sec. Lt. H. Waddington, Manch. R.; Temp. Sec. Lt. C. F. Jex, Gen. List, a Flying Officer; Temp. Sec. Lt. J. S. Curtis, Gen. List, Sec. Lt. R. T. Wilson, High. L.I., T.F., Temp. Sec. Lt. A. E. Burrows, attd. E. Lan. R., Jan. 9th.

MEMORANDA.—To be Sec. Lts. whilst serving with R.F.C.:—Serjt. J. Keyes, from R.F.C., Nov. 22nd, 1917. Temp. Serjt.-Maj. W. St. J. Littlewood, Dec. 27th, 1917.

The undermentioned to be temp. Sec. Lt. (on-prob.) Clement Hugh Gresswell, Dec. 27th, 1917.

The following extracts from a dispatch from Sir Douglas Haig, G.C.B., G.C.V.O., dated Dec. 25th, 1917, refer to the work of the Royal Flying Corps, during the battles of Arrás, Messines, and Ypres between April and Nov., 1917.

### Attack on defences in Vimy Ridge area on April 9th.

The great strength of these defences demanded very thorough artillery preparation, and this in turn could only be carried out effectively with the aid of our Air Services.

Our activity in the air, therefore, increased with the growing severity of our bombardment. A period of very heavy air fighting ensued, culminating in the days immediately preceding the attack in a struggle of the utmost intensity for local supremacy in the air. Losses on both sides were severe, but the offensive tactics most gallantly persisted in by our fighting aeroplanes secured our artillery machines from serious interference, and enabled our guns to carry out their work effectively. At the same time, bombing machines caused great damage and loss to the enemy by a constant succession of successful raids directed against his dumps, railways, aerodromes, and billets.

### Attack on the Messines-Wytschaete Ridge on June 7th.

As the date for the attack drew near fine weather favoured the work of our aviators, and artillery, and wire-cutting, the bombardment of the enemy's defences and strong points, and the shelling of his communications, billets, and back areas continued steadily. Counter-battery work was undertaken with great energy and with striking success.

### Attack on the Julien area on July 31st.

A definite aerial offensive had been launched, and the effective work of our aviators once more enabled our batteries to carry out successfully a methodical and comprehensive artillery programme.

### Enemy counter attacks.

Our artillery caused great loss to the enemy in these attacks, although the weather was unfavourable for aeroplane work, and observation for our batteries was difficult.

The weather had been threatening throughout the day, and had rendered the work of our aeroplanes very difficult from the commencement of the battle.

### Summary.

In the discharge of duties, constantly increasing in number and importance, the Royal Flying Corps throughout the whole of the past year has shown the same magnificent offensive spirit which characterised its work during the Somme Battle, combined with unsurpassed technical knowledge and practical skill.

The enemy, however, shows no sign of relaxing his endeavours in this department of war. While acknowledging, therefore, most fully the great effort that has been made to meet the ever-increasing demands of this most important Service, I feel it my duty to point out once more that the position which has been won by the skill, courage, and devotion of our pilots can only be maintained by a liberal supply of the most efficient machines.

\* \* \*

With reference to the awards conferred as announced in the "London Gazette," dated Sept. 26th, 1917, the following are the statements of service for which the decorations were conferred:—

### A BAR TO THE DISTINGUISHED SERVICE ORDER.

Lt. (temp. Capt.) WILLIAM AVERY BISHOP, V.C., D.S.O., M.C., Can. Cav. and R.F.C.

For conspicuous gallantry and devotion to duty when engaging hostile aircraft. His consistent dash and great fearlessness have set a magnificent example to the pilots of his squadron. He has destroyed no less than 45 hostile machines within the past five months, frequently attacking enemy formations single-handed, and on all occasions displaying a fighting spirit and determination to get to close quarters with his opponents which have earned the admiration of all in contact with him. (D.S.O. gazetted June 18th, 1917.)

### THE DISTINGUISHED SERVICE ORDER.

Sec. Lt. (temp. Capt.) ARTHUR CONINGHAM, M.C., R.F.C., Spec. Res.

With three other pilots he attacked an enemy machine which was protected by others, shot it down, and destroyed another one the same evening. Shortly afterwards he and two others attacked five of the enemy, and, although wounded and rendered unconscious for the moment, he succeeded in driving down two of the enemy. In spite of being much exhausted by loss of blood he continued his patrol until he was sure that no more enemy machines were in the vicinity, setting a splendid example of pluck and determination.

Temp. Sec. Lt. WILLIAM FREDERICK LEECH, Gen. List and R.F.C.

He carried out a number of valuable reconnaissances under difficult conditions, bringing back information which was invariably correct. When the situation was very obscure during an attack he correctly reported on it during the morning, and in doing so was wounded in the arm. In spite of this he went out again in the afternoon and was severely wounded.

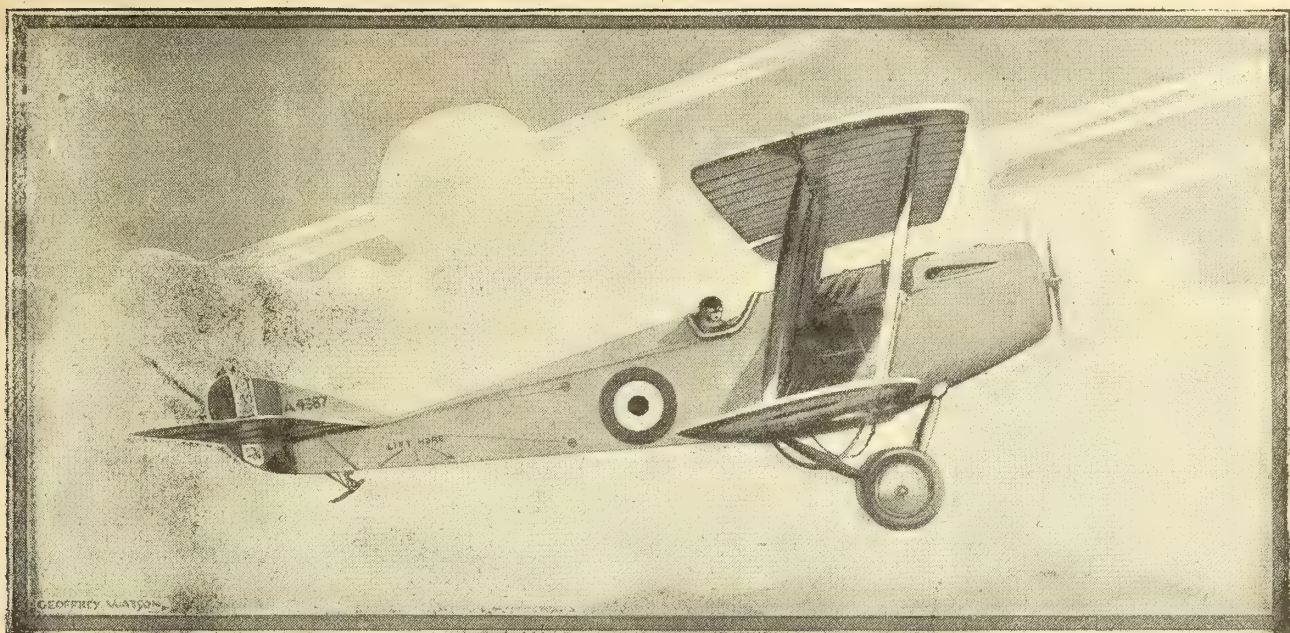
Lt. (temp. Capt.) REGINALD JOHN LOWCOCK, M.C., Notts and Derby R. and R.F.C.

For conspicuous gallantry and devotion to duty in carrying out artillery observation with great skill and success, in spite of very unfavourable weather and strong hostile opposition. On one occasion, although attacked by five hostile machines, he carried on with his work until his machine was riddled with bullets and he was wounded in the leg. He then succeeded in landing in safety, having destroyed one of the hostile machines. He has also done some exceptionally fine contact patrol work.

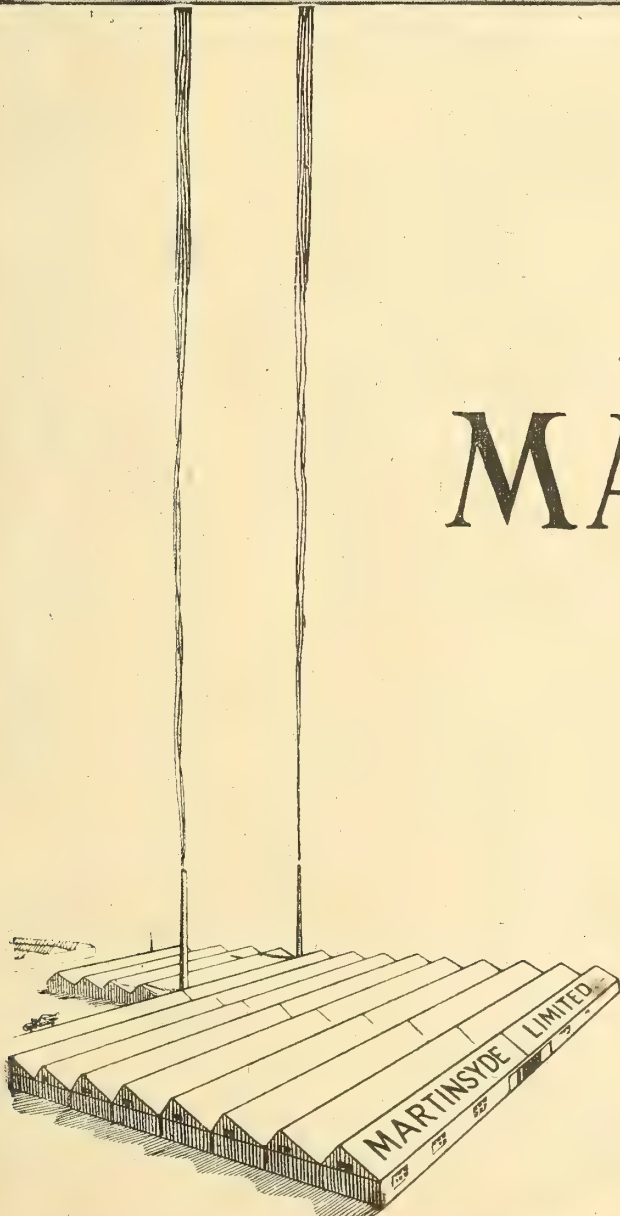
Sec. Lt. (temp. Capt.) BESTINE ENTWISLE SUTTON, M.C., Yeo. and R.F.C.

On very many occasions he carried out extensive and valuable reconnaissances and contract patrols at low altitudes, at-





# MARTINSYDE



Aerodrome . and  
Auxiliary Works:  
BROOKLANDS.  
Head Office  
& Works :  
WOKING , Surrey.





tacking infantry and transport with his machine-gun, and taking photographs which proved of the greatest value in subsequent operations. By his energy, skill, and courage he set a magnificent example to his squadron.

Temp. Maj. ERIC JAMES TYSON, M.C., Gen. List and R.F.C.

For conspicuous gallantry and devotion to duty on many occasions. He has displayed the utmost fearlessness in carrying out photographic reconnaissances and artillery registration at extremely low altitudes, being continually under fire, but invariably doing excellent work and obtaining most valuable information by his great skill and daring.

Sec. Lt. CLIVE WILSON WARMAN, M.C., Gen. List and R.F.C.

During two days whilst operating under very difficult conditions in high wind and against strong hostile opposition he destroyed three enemy machines and a balloon. He displayed the greatest dash and fearlessness in attacking an enemy aerodrome, and, on one occasion, when separated from his patrol, and surrounded by 20 hostile machines, he fought his way through, although his machine-gun was useless, by attacking them with his "Very" pistol; eventually regaining his own aerodrome with his machine much shot about. His wonderful coolness and courage have on all occasions been beyond praise.

A BAR TO THE MILITARY CROSS.

Lt. (temp. Capt.) SYDNEY HERBERT CLARKE, M.C., Wilts R., Spec. Res. and R.F.C.

For conspicuous gallantry and devotion to duty in carrying out contact patrols, reconnaissances, and artillery observation. He has frequently engaged bodies of hostile infantry at low altitudes, causing them heavy casualties, and although continually subjected to attacks from hostile machines and heavy machine-gun fire from the ground, which considerably damaged his machine, he completed his work in every case. On one occasion he took some exceptionally successful and valuable photographs of the enemy's wire from a height of 1,200 ft., and has also carried out a number of successful shoots in co-operation with artillery. (Gazetted, Nov. 14th, 1916.)

Temp. Capt. PHILIP FLETCHER FULLARD, M.C., Gen. List and R.F.C.

He has on many occasions displayed the utmost dash and fearlessness in attacking enemy aircraft at close range and in destroying at least eight hostile machines during a period of about 10 days. His determination and fine offensive spirit have in almost every instance resulted in disaster to the enemy. (M.C. gazetted in this "Gazette.")

Temp. Sec. Lt. (temp. Maj.) GEORGE BARNARD WARD, M.C., Gen. List and R.F.C.

When in one of three machines engaged on photographic reconnaissance they were attacked by a formation of nine hostile scouts. A determined resistance was offered to this attack, which was beaten off, and the photographs were then taken. Whilst returning to the aerodrome this officer turned back alone to take some further photographs, and observing six hostile machines approaching he promptly attacked them at close range, and after a sharp fight brought one down and drove off the remainder. He then completed his photography. (M.C. gazetted Nov. 25th, 1916.)

Temp. Capt. NOEL WILLIAM WEBB, M.C., Gen. List and R.F.C.

For conspicuous gallantry and devotion to duty in aerial

combats. He has destroyed three hostile machines and driven down four others completely out of control. By his spirit and gallantry he has set a fine example which has inspired the pilots of his flight to successfully attack enemy formations many times more numerous than their own. (M.C. gazetted Jan. 1st, 1917.)

Sec. Lt. WALTER BERTRAM WOOD, M.C., Hamps R. and R.F.C.

For conspicuous gallantry and devotion to duty in attacking enemy aircraft. On several occasions he has shown admirable dash and determination in attacking hostile machines single-handed, destroying some and driving others down out of control. He has also displayed great daring in attacking enemy infantry and transport with machine-gun fire at very low altitudes in spite of attacks by hostile aircraft whilst so engaged. (M.C. gazetted Sept. 17th, 1917.)

THE MILITARY CROSS.

Sec. Lt. REGINALD BRUCE ASHCROFT, Notts and Derby R., Spec. Res. and R.F.C.

He rendered invaluable assistance to our infantry in the attack, flying several times through heavy barrage and using his machine-gun at a very low altitude. He has consistently done splendid work in contact patrols and in attacking enemy infantry from low altitudes.

Temp. Sec. Lt. NOEL EDGAR BARRACLOUGH, Gen. List and R.F.C.

For several months he has done work of a consistently high order as pilot, continually harassing the enemy's infantry with machine-gun fire and remaining on one occasion for two hours in extremely bad weather at a very low altitude on patrol before an offensive. On this occasion his observer was wounded by the intense fire to which his machine was subjected. His photographic reconnaissances and artillery observation have on all occasions been accurate and valuable.

Temp. Capt. ANGUS BELL-IRVING, Gen. List and R.F.C.

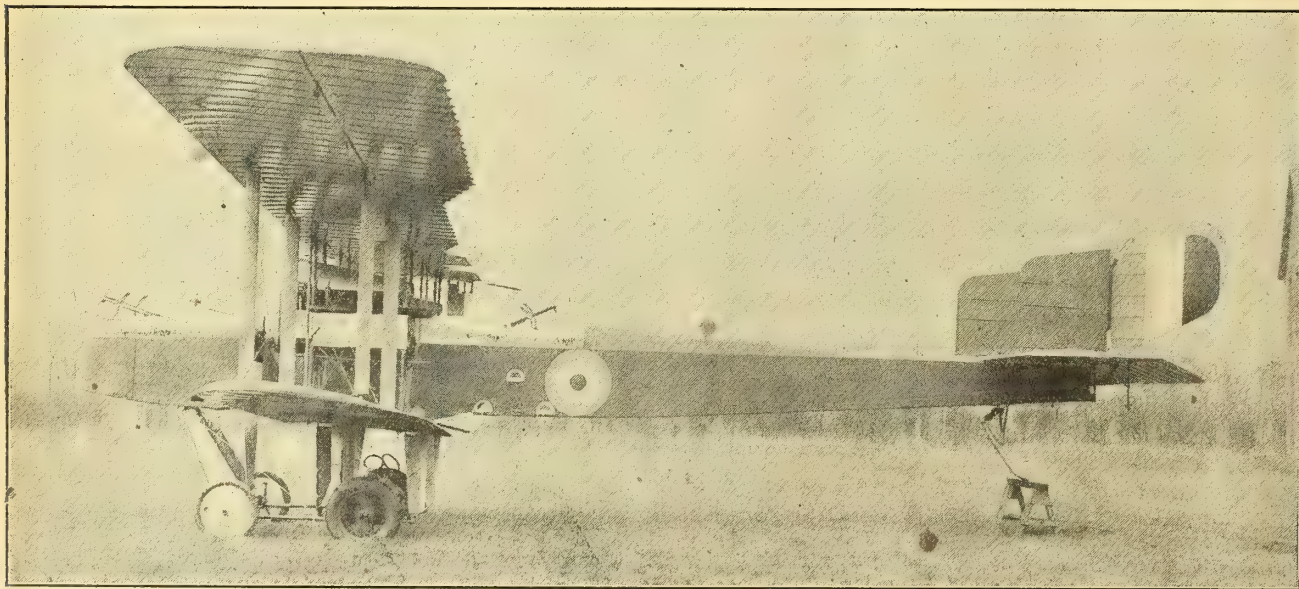
During the last five months he has taken part in many offensive patrols, the majority of which have entailed very heavy fighting. He has on numerous occasions attacked enemy formations double the strength of his own and dispersed them. On one occasion by his gallantry and self-sacrifice he saved another machine from certain destruction during continuous and severe fighting with ten enemy machines, returning to his lines with his own machine so shot about that it was unfit for any further use. His gallantry and devotion to duty have on all occasions deserved the highest praise.

Capt. ROBERT BENEDICT BOURDILLON, R.F.C., Spec. Res.

For conspicuous gallantry and devotion to duty on long-distance bomb raids. He has in all taken part in 17 successful raids, many of which were on distant objectives and in unfavourable weather, and has been exceptionally successful in attacking railways, frequently descending to very low altitudes with the greatest determination in order to make su. of his aim. He has set a very fine example by his courage and offensive spirit.

Temp. Lt. ALLAN BOYLE, Gen. List and R.F.C.

For conspicuous gallantry and devotion to duty when engaged upon artillery observation work. By his determination and fearlessness he has been most successful in this important service, in addition to which he has carried out several successful contact patrols at low altitudes, although subjected to at-



ANTE-DATING THE ENEMY.—The Fairey Aviation Company's Twin-engined Folding-wing Biplane. Designed by Mr. C. R. Fairey in December, 1914. Built in the Summer of 1916. Delivered in the Autumn of 1916. It had a remarkably good performance.



THE BRITISH & COLONIAL  
AEROPLANE CO, LIMITED

— FILTO , BRISTOL —

CONSTRUCTORS OF

*The "Bristol" Aeroplanes.*

— CONTRACTORS TO —  
H.M. AIR FORCES.

Telegrams :  
" AVIATION, BRISTOL "



Telephones :  
3906 BRISTOL  
(Private Branch Exchange)

lack from hostile machines, and heavy machine-gun fire from the ground, which considerably damaged his machine.

Sec. Lt. GEORGE THOMAS WILLIAM BURKETT, R.F.C., Spec. Res.

With his patrol he engaged a superior force of enemy machines, and, although wounded early in the engagement, continued to fight. He brought down two hostile machines, and drove off two more whilst returning to our lines with his own machine badly damaged. In spite of this, however, he succeeded in making a good landing. He displayed splendid dash and coolness under very trying circumstances.

Temp. Sec. Lt. ROBERT MOVERLY BURNARD, Gen. List and R.F.C.

For conspicuous gallantry and devotion to duty as pilot in an artillery squadron. He has a very large number of successful artillery shoots to his credit, and has specially distinguished himself in carrying out exceptionally long flights during which he has attacked hostile infantry from a low altitude and furnished most valuable information to our artillery regarding the dispositions of the enemy. He has always set a fine example of fearlessness and determination.

Sec. Lt. (Temp. Lt.) JAMES CAIRNS, R.E. and R.F.C.

He has been continuously successful and skilful for five months, doing his own piloting and observing. He has frequently ranged two or more batteries simultaneously and brought back numerous valuable reconnaissance reports. He has also displayed the utmost fearlessness and a fine offensive spirit in attacking and destroying enemy strong points and ammunition dumps, acting in conjunction with our artillery. His work has, on all occasions, been marked by accuracy and the highest degree of initiative and energy.

Lt. (Temp. Capt.) CLIVE FRANKLYN COLLETT, R.F.C., Spec. Res.

For conspicuous gallantry and devotion to duty as a leader of offensive patrols during a period of three weeks. He has on numerous occasions attacked large formations of enemy aircraft single-handed, destroyed some, and driven others down out of control. He has led his formation with great skill, and has on several occasions extricated them from most difficult positions, and in every engagement his gallantry and dash have been most marked.

Temp. Lt. GERARD BRUCE CROLE, Gen. List and R.F.C.

For conspicuous gallantry and devotion to duty in aerial fighting on many occasions. By his determination and fine offensive spirit in attacking hostile aircraft he has continually proved his superiority over the enemy, destroying several enemy machines and driving many others down out of control.

Sec. Lt. WILLIAM LOUDON DOUGLAS, Lond. R., and R.F.C.

For conspicuous gallantry and devotion to duty in carrying out a large number of very successful photographic reconnaissances. He has repeatedly displayed the greatest fearlessness and determination, attacking enemy troops from a low altitude, and disregarding the attacks of hostile machines in superior numbers and adverse weather conditions, in order to obtain satisfactory photographs.

Sec. Lt. (Temp. Lt.) REGINALD MICHAEL DUFF FAIRWEATHER, High. L.I., Spec. Res. and R.F.C.

For conspicuous gallantry and devotion to duty when co-operating with artillery. He has carried out an exceptional number of successful shoots during the last eight months, on one occasion ranging a howitzer on a hostile battery, destroying the ammunition, and wrecking the battery position. He has consistently shown great skill in carrying out his duties as observer.

Sec. Lt. (Temp. Lt.) CUTHBERT DORSET FELLOWES, R.F.C. and Yeo.

In order to save an aeroplane which had fallen between our lines and those of the enemy he twice crawled over 300 yards of open ground in full view of the enemy, started up the engine, and, lying flat on the ground, allowed the machine to pass over him. He then ran after it and gained the pilot's seat. The machine left the ground, and, as all the controls

had been shot away, he shut off the engine and drove it out of range of the enemy's guns. He has displayed consistent gallantry in numerous air combats.

Temp. Capt. JAMES FITZ-MORRIS, Gen. List and R.F.C.

For conspicuous gallantry and devotion to duty on photographic and offensive patrols. On at least four occasions he has displayed great dash and courage in attacking hostile machines, two of which he completely destroyed, and has driven others down out of control.

Temp. Sec. Lt. (Temp. Capt.) PHILIP FLETCHER FULLARD, Gen. List and R.F.C.

For conspicuous gallantry and devotion to duty when engaged in aerial combat. He has on four occasions attacked and destroyed enemy aircraft, and has in addition engaged in 25 indecisive combats, in which he has shown fine leadership, great dash and determination to close with the enemy.

Temp. Lt. FREDERICK JOHN GIBBS, S. Staff. R. and R.F.C.

For conspicuous gallantry and devotion to duty in attacking enemy aircraft and engaging hostile troops from the ground. He has in all driven down five enemy machines, which were destroyed, and one other completely out of control. He has also attacked and silenced a hostile battery with machine-gun fire, displaying on every occasion the same dash and determined offensive spirit.

Lt. EDWARD GRIBBEN, R. Ir. Rif., Spec. Res. and R.F.C.

For conspicuous gallantry and devotion to duty on offensive patrols. In every combat he has been most conspicuous, continually attacking superior numbers of the enemy, destroying some and driving others down out of control. He fights with great dash and skill, and whenever any machine of his formation is in difficulties, he is invariably at hand to render assistance.

Temp. Sec. Lt. (Temp. Lt.) BERTIE CONSTANTINE RUFFELL GRIMWOOD, R.F.A. and R.F.C.

Having located a strong force of enemy infantry coming up to counter-attack, his machine was immediately afterwards hit by a shell, which wounded him severely and destroyed his wireless apparatus. His machine was obviously so badly damaged that no expert would have believed it could possibly have held together in the air, but in spite of this and of his wounds he wrote out a message reporting the position of the enemy and dropped it on divisional headquarters, who were able to put nine batteries onto the target. His pluck and devotion to duty were worthy of the highest praise.

Sec. Lt. ROBERT NORWOOD HALL, R.F.A., Spec. Res. and R.F.C.

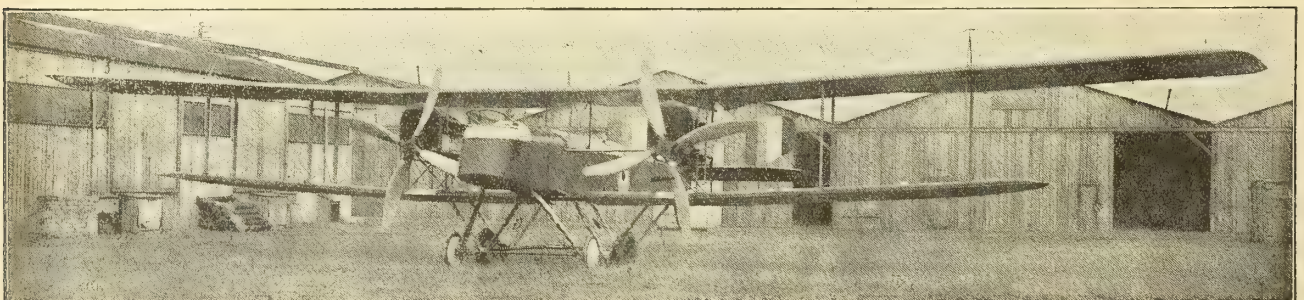
He has shown consistent fearlessness and determination in attacking hostile aircraft at close range, destroying some and bringing others down out of control. On one occasion he attacked three enemy pilots, bringing two down in flames and leaving the third on fire. To accomplish this he crossed the lines at a height of 20 feet, his machine being severely damaged by machine-gun fire from the ground. His gallantry and skill have on all occasions been most noticeable.

Lt. (Temp. Capt.) ROBERT WILLIAM PAYLOR HALL, R.F.A. and R.F.C.

For conspicuous gallantry and devotion to duty during a period of four days. He succeeded in ranging our guns most successfully and causing considerable damage to the enemy, in spite of being engaged by hostile aircraft in considerable numbers, and exposed to heavy anti-aircraft fire. On another occasion, when his machine had been practically destroyed by anti-aircraft shell and he had been wounded himself, he displayed wonderful skill and coolness in landing safely behind our lines.

Sec. Lt. (Temp. Capt.) HOWARD REDMAYNE HARKER, R.F.C., Spec. Res.

For nearly a year he has carried out extremely valuable work in taking aeroplane photographs and leading bombing



Three-quarter front view of the Pairey Twin-engined Folder Bi plane.



# MANNECERTON & Co.Ltd.

CONTRACTORS TO THE ADMIRALTY  
AND H.M. WAR OFFICE.

Designers and  
Manufacturers of Proved  
Efficiency of all Types of  
**AIRCRAFT**

HEAD OFFICE AND WORKS

**AIRCRAFT WORKS, NORWICH**

---

SPECIAL DEPARTMENT  
for the manufacture of  
**AIRCRAFT ACCESSORIES**  
(Strainers, Bolts and Nuts, etc., etc.)  
177, CLEVELAND ST., LONDON, W.1.

# MANNECERTON & Co.Ltd.

LONDON

NORWICH

IPSWICH

BURY ST. EDMUNDS.

raids far behind the enemy lines, often in the face of great opposition and trying weather conditions. On a recent occasion while returning from a successful bombing raid his formation was attacked by more than twice its number, but by his fine offensive spirit and skilful leadership, the enemy were dispersed. He has consistently set a splendid example to his brother officers.

Sec. Lt. (Temp. Capt.) SWITHIN GANE HODGES, Wilts R. and R.F.C.

For many months he has done continuous successful work and photography, and by his skilful observation has been the means of inflicting great damage upon hostile batteries and ammunition dumps. He has consistently displayed great gallantry, frequently working under adverse weather conditions.

Temp. Sec. Lt. SAMUEL JOLLEY, Gen. List and R.F.C.

For conspicuous gallantry and devotion to duty when being heavily shelled in his balloon. Although under fire for two hours from guns in four different positions, he engaged them in his balloon and silenced three. The shelling was accurate and his balloon was punctured, but he continued to remain up another two hours and reported the enemy's movements.

Lt. FORDE LEATHLEY, R. Inns. Fus. and R.F.C.

For conspicuous gallantry and devotion to duty in making photographic reconnaissances and in fighting enemy aircraft. Since April he has taken part in numerous combats, during which seven hostile machines have been driven down and destroyed either by him or his pilot, and although attacked by superior numbers of the enemy, his skill and offensive spirit have enabled him to carry out photographic reconnaissances.

Sec. Lt. (temp. Lt.) GEORGE MARTIN LEES, R.G.A. and R.F.C.

For conspicuous gallantry and devotion to duty on numerous occasions. His work has been invaluable both when engaged in ranging batteries on hostile trenches and in making daring and valuable reconnaissances at low altitudes over the enemy's trenches. On at least two occasions while on photographic duty he was attacked by superior numbers of the enemy, one of whom he shot down and dispersed the remainder, returning from his flight with a number of successful exposures. All his work has been of this high order.

Temp. Sec. Lt. THOMAS ARCHIBALD MITFORD STUART LEWIS, Gen. List and R.F.C.

While acting as observer his patrol engaged a superior force of enemy scouts. His pilot was wounded, but they continued to fight, destroying one enemy machine. He was then severely wounded, but continued to work his gun lying on his back. By this means they were able to destroy a second enemy machine. Afterwards, when returning to our lines with their machine badly damaged, he and his pilot drove off two machines which were pursuing them, having displayed the greatest gallantry and presence of mind.

Sec. Lt. REGINALD MILBURN MAKEPEACE, R.F.C., Spec. Res.

For conspicuous gallantry and devotion to duty whilst on an offensive patrol. He and his gunner shot down three enemy aircraft in quick succession, having attacked a large hostile formation, about 20 in number, with great dash and determination.

Lt. RICHARD AVELINE MAYBERY, Lrs. and R.F.C.

After attacking two aerodromes in succession at very low altitudes, and inflicting considerable damage, he attacked and dispersed a number of mounted men and then attacked a goods train. He next attacked and shot down a hostile machine at 500 ft., and before returning attacked a passenger train. On numerous occasions he has attacked, single-handed, large hostile formations and set a fine example by his gallantry and determination.

Temp. Capt. WILLIAM ARTHUR McCLATCHIE, Gen. List and R.F.C.

For conspicuous gallantry and devotion to duty in aerial fighting and reconnaissances on many occasions. He has shown great dash and fearlessness in engaging enemy infantry and taking photographs at very low altitudes, on one occasion after inflicting heavy casualties bringing his machine back, although it was very badly shot about, and crossing the lines under very heavy fire at 200 ft. On another occasion he attacked a hostile machine and drove it down, and although attacked by three enemy scouts on his way back he successfully drove them off.

Sec. Lt. DOUGLAS URCHART MCGREGOR, R.F.C., Spec. Res.

For conspicuous gallantry and devotion to duty in leading patrols against hostile formations. He has attacked and driven down enemy aircraft on several occasions, in spite of their being in superior numbers, displaying in every instance splendid dash and determination to get to close range.

Capt. WILLIAM EARLE MOLESWORTH, R. Muns. Fus. and R.F.C.

For conspicuous gallantry and devotion to duty on offensive patrol. He has frequently led his patrol against superior numbers of the enemy, destroying some and dispersing others. He has also brought down two balloons, and has proved himself to be a dashing and fearless pilot of great skill and determination.

Lt. (temp. Capt.) KEITH DAY PEARCE MURRAY, R.F.C., Spec. Res.

For conspicuous gallantry and devotion to duty on numerous occasions. He has displayed the utmost skill and fearlessness in ranging our batteries on hostile battery positions. Most of this work he had to carry out at a very low altitude and under very heavy fire, owing to the fact that the target was very well camouflaged, but, in spite of being repeatedly attacked and his machine several times damaged by anti-aircraft and machine-gun fire, he was invariably successful.

Temp. Sec. Lt. ARTHUR REX HURDEN MOSS, Gen. List and R.F.C.

During an engagement with several large hostile formations the two machines with which he was patrolling were put out of action. In spite, however, of being left alone he continued to attack, and engaged the enemy in so determined a manner that he and his pilot between them destroyed one and drove three others down completely out of control. He has performed several other fine feats, and has at all times set a most inspiring example by his dash and tenacity.

Sec. Lt. CONN STANISH O'GRADY, R.F.C., Spec. Res.

For conspicuous gallantry and devotion to duty in leading fighting patrols against superior numbers of enemy aircraft. He has himself brought down three enemy machines completely out of control, and others were seen to be destroyed, and his dash and determination when outnumbered by the enemy have continually won the highest praise.

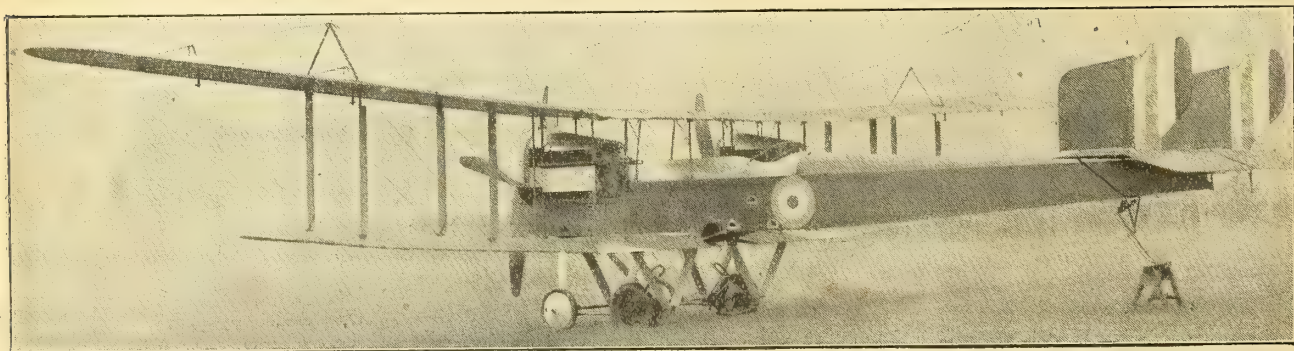
Sec. Lt. KEITH RODNEY PARK, R.F.A. and R.F.C.

During an engagement with several large hostile formations the two machines with which he was patrolling were put out of action. In spite, however, of being left alone, he continued to attack, and engaged the enemy machines in so determined a manner that he and his observer between them destroyed one and drove three others down completely out of control. He has performed several other fine feats, and has at all times set a most inspiring example by his dash and tenacity.

Temp. Sec. Lt. ALEXANDER AUGUSTUS NORMAN PENTLAND, Gen. List and R.F.C.

On a recent occasion he flew to an aerodrome 15 miles behind the enemy lines, descended to within 20 ft. of the ground, and fired into eight hostile machines. On his return journey he attacked a train with considerable effect from a low altitude.

(Continued on page 351.)



Three-quarter rear view of the Fairey Twin-engined Folder Bi plane.



# AT LAST —

## Accurate Measurements to one ten-thousandth of an inch.

**I**F you have to compare your work with a standard you cannot afford to be without the Prestwich Fluid Gauge.

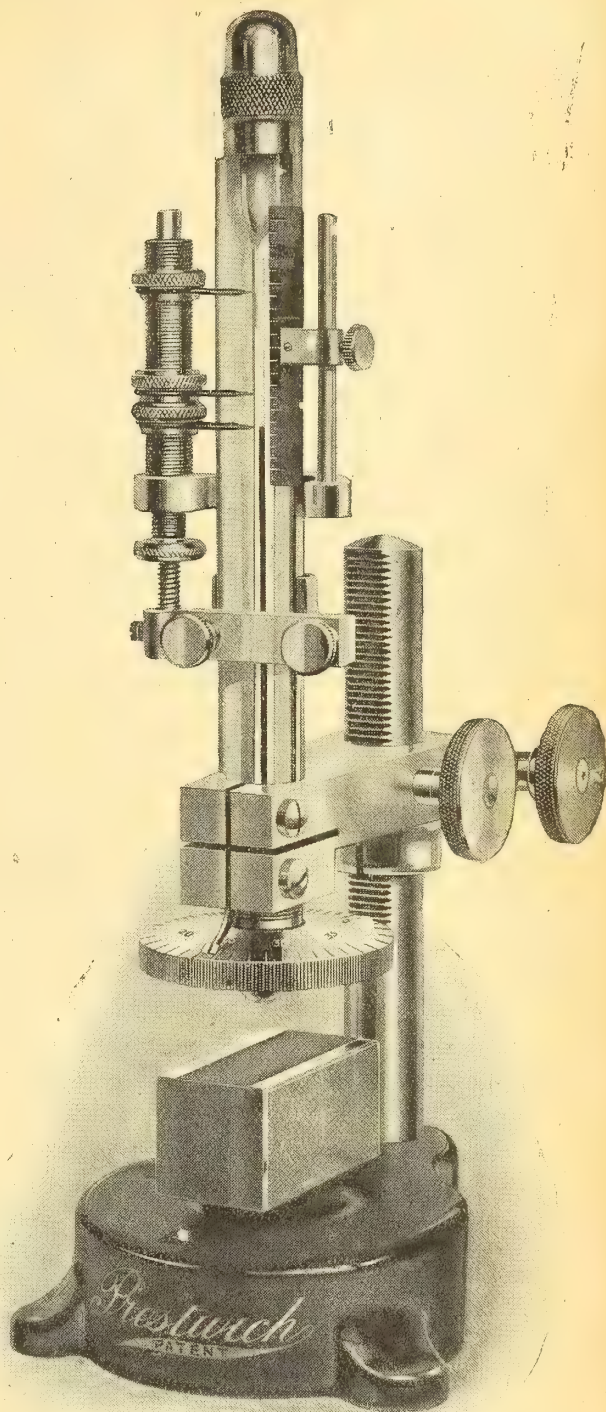
It quickly and definitely will indicate whether or not the work is within the limits, and also the exact amount of any error.

## Sense of Touch is Eliminated,

thus skilled viewers are not essential. Readings may be taken to  $\frac{1}{50,000}$  part of an inch at the rate of about 60 per minute if necessary.

The instrument is ideal for gauging all kinds of spindles, rollers, etc., and parts used in aero-engine construction. It is invaluable in settling disputes which continually arise between viewers and inspectors.

Write to us for full particulars stating any special purpose for which you require accurate gauging. We have all kinds of adaptations.



An error of  $\frac{1}{1,000}$  of an inch is indicated by  $1\frac{1}{2}$  inches travel on the column

# *The Prestwich* FLUID *Gauge*

*Accuracy to the ten-thousandth part of an inch with ease*

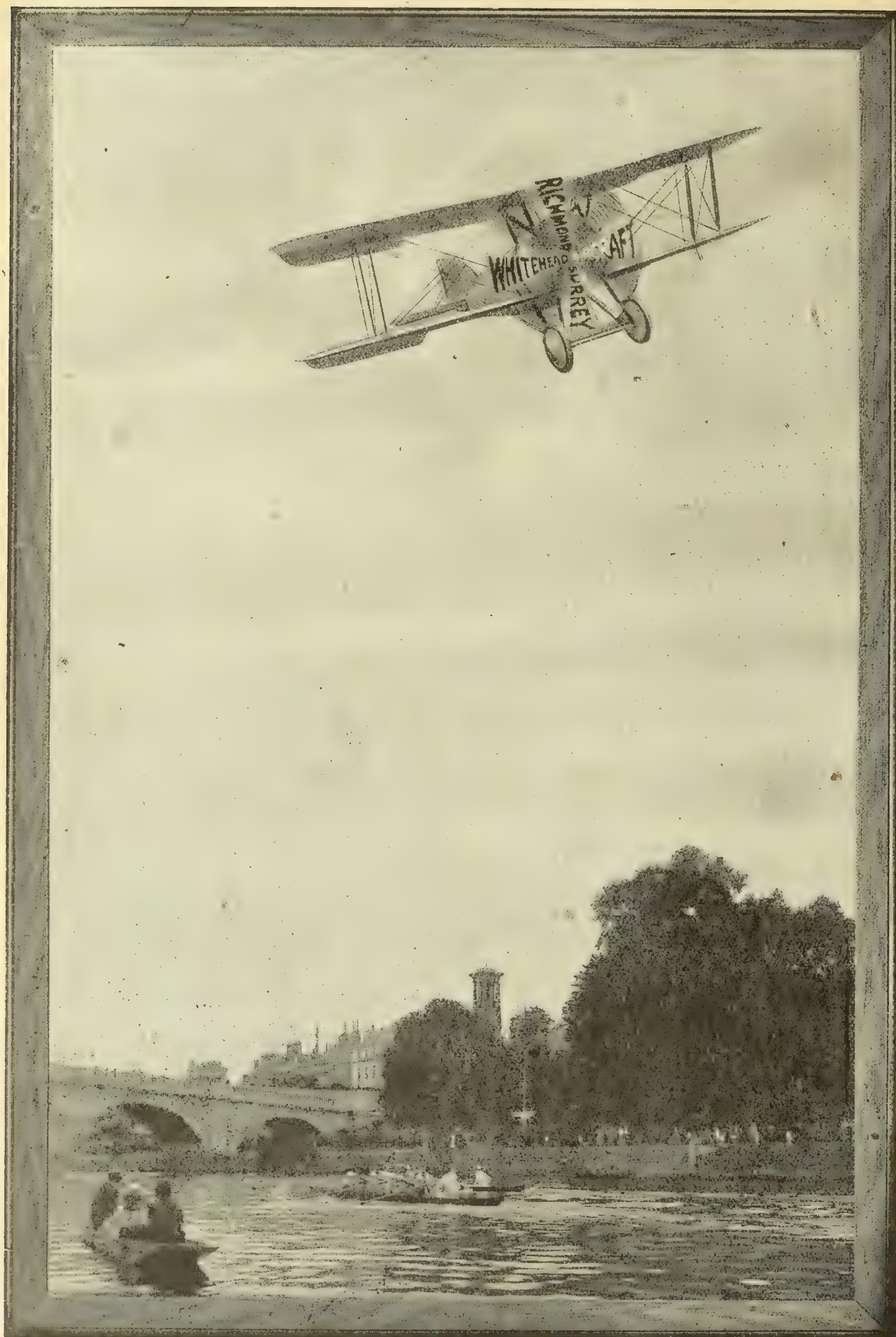
Manufactured by

**J. A. PRESTWICH & CO., Northumberland Park, TOTTENHAM, N. 17.**

*"Makers of the world-famous "J. A. P." Engine.*

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# GNÔME & LE RHONE ENGINE COMPANY

**Contractors to the  
War Office and Admiralty**

**London Offices :**

**47, VICTORIA STREET, S.W.1., and THE HYDE, HENDON, N.W.9.**

**Works: Blackhorse Lane, Walthamstow.**

“ “ CONTRACTORS TO “ “  
HIS MAJESTY'S WAR OFFICE

*Messrs. Gordon Watney & Co. Ltd*

**AERONAUTICAL AND  
GENERAL ENGINEERS  
South Lodge Motor Factory  
WEYBRIDGE**



Telephones **WEYBRIDGE 550 (7 lines),**

Telegrams: "**MERCEDES, WEYBRIDGE.**"



# AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER

## Piecework: Why, and Why Not.

BY G. E. FFISKE.

(From the "B. and P."—The House Journal of Boulton and Paul, Ltd.)

This much whipped topic causes me to lay a few facts down, which I am sure are worthy of consideration by those who are interested.

We find to-day in certain districts two distinct opinions on this subject between two distinctly different trades, namely, the Engineers and the Woodworkers.

It has now become common practice to recognise Engineers as pieceworkers, and Woodworkers as day-workers, and why? The policies of the societies are different, but why should they be so widely different? This question has puzzled me for some considerable time, until I am now led to believe the reasons are two-fold.

(1) While the working conditions of both trades are now almost the same, at the time when the Societies' Policies were set the conditions were widely different.

(2) The Engineering Trade is a more recent trade, and increasing more rapidly, and in consequence more flexible to changes in working conditions.

Dealing with the two conclusions I have drawn, we find in our wood-working shops to-day one society predominating, and it is therefore fair to conclude that its code of rules will also predominate.

Now, were not these rules drawn up for totally different conditions from those that actually prevail? Were not the rules, in fact, drawn up to protect a trade mainly working outside where perhaps the prohibition of piecework was vital; where adverse conditions of weather might cripple the earnings of the hardest pieceworker? These conditions are not so now, and we find the woodworker working side by side with the engineer, the one dependent on the other's output, with the same conditions for both.

I am led to my second conclusion by the fact that the Engineer, although a staunch stickler to his Society's rules, is never content unless progressing to a higher aim. How many young engineers are content to stay at the works nearest their homes? They would rather move from works to works to gain experience and progressive ideas. Such as these are leading the engineering world of to-day, and are the designers and inventors of the most modern and deadly war machines. It is thus we find the Engineer more flexible to new schemes whatever they may be.

The conservative ideas and staunch stand to the rules is to be greatly admired in the Woodworkers up to a point, but beyond that, I feel that new ideas should receive closer consideration of the *pros* and *cons*.

The very first thing that a worker is bound to question is—why are our employers so anxious that we should work piecework—are they so generous that they are going to give us something and get nothing out of it? No, of course not. Then how can employers pay more and still make more for themselves? It is this I will explain.

It will I am sure be granted that profit sharing between the employee and employer is a good step to maintain the interest of workers and secure their best energies. This is the aim desired; the worker being paid over and above his contracted rate in accordance with the profit he earns for the company.

Before setting out an example to explain the working, it must be understood that the cost of all finished articles is made up of three things:—(a) Labour cost. (b) Material cost. (c) Overhead charge or cost of running workshop.

The advantages of piecework to an employer is in the last-named item.

Workshop charges consist of rent of buildings, heating, lighting, power, upkeep of machinery, foremen's and charge hand's salaries, and a dozen and more things. It may be surprising to a number of employees, but it is a fact that the cost of these

overhead charges is on an average more than the total (day-work) wages bill in a year, but for the purpose of my example, we will assume that it is the same.

In actual practice, some shops cost more and some less than the wage bill. I will take an example of propeller finishing.

Say—  

	£	s.	d.
The average wages paid per week to 50 men, for 60 hours at 1s. per hour	...	...	...
Cost of running workshop, overhead charge	...	...	...

Total	...	...	...
Assume each Propeller on day-work takes 25 hours to make, then 120 Propellers can be finished in a week, for the cost of	...	...	...
Which is equal to £2 10s. each (for labour and workshop charges).	...	...	...

Now supposing we work on piecework, the cost of running the workshop is obviously the same, and supposing we allow 30 hours for the finishing of each propeller instead of 25 hours, which was the time taken on day-work conditions, the effect would be that it would be up to each man to make as many propellers as possible in a week, as he would be paid 30 hours for each propeller finished. This being so, let us assume that he is able to finish a propeller in 20 hours instead of 25, then in a week, instead of the shop making 120 propellers, it would make 150 propellers. The cost, therefore, would be as follows:—

	£	s.	d.
Cost of making 150 Propellers at 30 hours pay for each	...	...	...
Workshop cost as before	...	...	...
For 150 propellers	...	...	...
Which is equal to £2 10s. per propeller.	...	...	...

From this example it will be seen that although the man takes home 50 per cent. extra pay, the propeller still costs the same. If the man takes home more than 50 per cent. pay, the propeller would cost less than £2 10s. because more propellers would be made to spread the workshop cost over, so the higher the extra money drawn by the man, the better it pays the Company. In a nutshell, it pays the employer better by getting every bit of output possible from his factory which within limits costs the same to operate whether 100 or 1,000 propellers are made.

The second and all important question to a worker is—will the prices be cut even if the earnings got up to say, 100 per cent.? At the present time this is illegal, and if it were not, there is no advantage to be gained by the employer from cutting rates. Firstly, because the essence of success of a piecework scheme is complete confidence between employee and employer, which would fall to the ground if the cutting of rates were commenced, and, secondly, it may be taken as a general rule that the time allowed the worker is the time allowed for in estimating the selling price on which the order was obtained. If, therefore, a man does it in less time, and earns higher money, it is his extra profit, and the time saved off workshop charges is the employer's extra profit.

The third point is the effect of piecework on a man's health. Does it ruin the Engineers? No! and why should it the Woodworkers? On the contrary extra earnings mean more comfortable homes, and every other advantage extra money brings.

Try as I may I cannot conceive where the real obstacle lies which prevents piecework on such a basis. Times are advancing rapidly, and none can afford to stand on principles the foundations of which have gone with the times.



# The Wind Channel: Its Design and Use.—(Continued.)

BY J. R. PANNELL.

## LATER CHANNELS.

Since the No. 1 4ft. there have been constructed the 3ft. and No. 1 7ft. in 1914, and in the new Aeronautics Building the No. 2 4ft. and No. 2 7ft. in 1916.

The changes in design have been mainly in the balance; those in the channel consist in substituting slots for square holes in the distributor, and in turning back the trumpet mouthpiece till it touches the parallel part of the channel. The latter step was taken to prevent the formation of vortices, which were found to be formed at the edge of the original trumpet.

The speeds also have been increased, the highest values for the various channels being: No. 1 4ft., 50ft./sec.; 3ft., 60ft./sec.; No. 1 7ft., 65ft./sec.; No. 2 4ft. and No. 2 7ft., 80ft./sec. In connection with the high speed attained in the two newest channels it may be remarked that they are very noisy, and observers usually find it necessary to protect their ears with ear-defenders or cotton wool against the very intense vibrations which are set up over about 60ft./sec. The author is informed that the Kingsnorth channel, in which a speed of 100ft./sec. is attained, and in which the fan is driven by a petrol motor, is much less noisy, and it has been suggested that the vibrations of the N.P.L. channels are due to the laths of the distributor.

The newer channels also have an additional honeycomb between the balance and the airscrew. This has the effect of entirely preventing spin of the air due to the rotation of the airscrew, but causes an appreciable increase in the resistance of the channel. It is probable that guide blades of lower resistance would be equally effective.

Two important changes have been made in the design of the balance, namely, in the apparatus for measuring moments about a vertical axis and in the method of determining forces along that axis.

The method of measuring vertical force by a rod moving relatively to the balance has been abandoned in favour of the observation of the change in effective weight of the whole balance. No details of the arrangement can be given at present, but it may be stated that on the balance of the No. 2 7ft. channel forces can be measured with ease to 0.001lb., which is the 1/100000th part of the total weight of the balance.

## ERECTING THE MAIN BALANCE.\*

In order that certain conditions essential for accurate working shall be fulfilled, it is necessary that the erection of the balance be carried out with considerable care. The methods which are used for this purpose and to check the accuracy of workmanship will now be described.

### VERTICAL AXIS OF ROTATION IN MOMENT MEASUREMENTS.

When the balance is arranged for the measurement of moments about a vertical axis the strut which prevents motion about this axis when lift and drag are being measured is removed, and the lower extremity of the balance engages a centre, the position of which, in conjunction with the main supporting point of the balance, fixes the axis of rotation. The position of this lower centre is adjusted till the axis of the balance is vertical, when hanging weights on the lift and drag beams produces no moment about the axis of rotation. The sensitivity of the moments measuring apparatus renders the method easily accurate to an inclination of the axis of 0.005 degree. The axis of rotation in the N.P.L. channels is vertical to an accuracy of about 0.03 degree. The clamp which locks the balance should be arranged to hold it in approximately the same position when the lower centre is not in use.

### POSITION OF AXIS OF ROTATION OF UPPER PART OF BALANCE.

It is a matter of considerable convenience in measurements of moment about a vertical axis if the axis of rotation in changing the angle of incidence of the model coincides with that about which moments are measured. The relative positions of these two axes can be determined by fixing a point to the upper portion of the balance, adjusting it to lie in the axis of rotation of the upper portion, and then hanging from it a weight. If the balance remains in equilibrium when supported on a single point, the axis under examination is vertical, and therefore in coincidence with that about which moments are measured. If the balance turns under the weight, it must be returned to its zero position by changing the weights on the lift and drag beams, and the process repeated with the point at a new height in the channel. Readings of the beams in the two cases enable the position of the axis to be determined.

The N.P.L. balances have been adjusted till the deviation at the centre of the channel does not exceed 0.01 in.

### ANGLE BETWEEN THE LIFT AND DRAG BEAMS.

The ratio of the lift to drag in the test of an aerofoil is usually of the order of 17 as a maximum, and a very small error in setting the lift and drag beams at right angles may introduce a

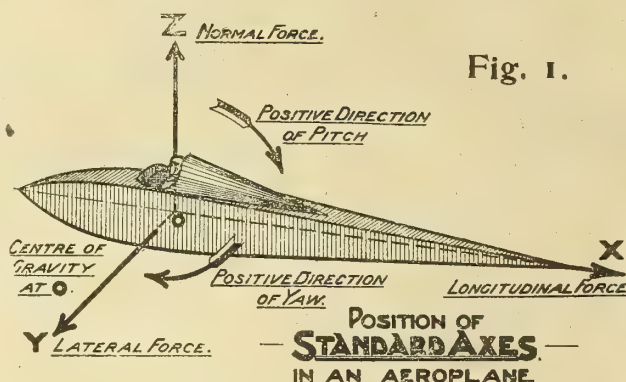


Fig. 1.

serious error in the measurement of drag. It has been shown that in order to avoid errors in the drag measurement exceeding 1 per cent. when the ratio of lift to drag is 15, it is necessary that the angle between the beams shall be 90 deg. to an accuracy of  $\pm 0.05$  deg. If the linear distances between the scale pan centres and the point of the balance can be accurately determined, the most direct method of measuring this angle is to compare the sum of the squares of these lengths with the square of the distance between the two scale pan centres. It was inconvenient to measure directly the lengths of the beams, and a temporary weighing arm was fixed to the upper part of the balance for the purpose.

This was set in turn parallel to the lift and drag beams, and a weight of 1lb. moved through an accurately measured length. The moment thus caused was measured on the beams and the distance of each scale pan from the point of support of the balance deduced. The method of calculating the angle, referred to above, can now be applied. The angle between the beams in each of the N.P.L. balances is 90 deg. with an error not exceeding 0.02 deg. The error in the drag measurement will not exceed  $\frac{1}{2}$  per cent. due to this cause, and will usually be much less.

### DETERMINATION OF WIND DIRECTION AND ITS RELATION TO THE POSITION OF BEAMS.

The accuracy with which it is necessary to set the beams along and across the wind direction is the same as that with which the angle between the beams is required to be a right angle. An error in the two cases has the same result, viz., to include a component of the lift in the drag measurement.

The wind direction has been found to be parallel to the walls of the channel to an accuracy of 0.1 degree, but it is determined by the experiment which gives the angle between it and the drag beam.

The method which has been used for this determination is to mount an aerofoil in the balance, with its span vertical, and measure the lift and drag over the usual range of angle. The model is then rotated through 180 deg. about the wind direction (thus reversing the direction of the lift) and a second set of measurements taken. The mean of the two sets gives the true value of the forces, and their difference enables the errors of wind direction and balance setting to be determined.

An actual set of observations which was obtained in calibrating one of the channels is shown in Fig. 2. The two lift curves differ by an angle of 0.2 deg. the datum line to which the aerofoil was set being half this amount in error from the true wind

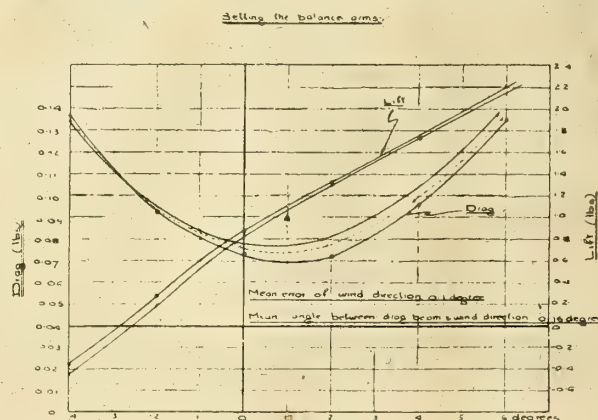


Fig. 2.

\*Rpt. Adv. Comm. for Aero., 1912-13, p. 59 et seq.

\*Rpt. Adv. Comm. for Aero., 1912-13, p. 63.



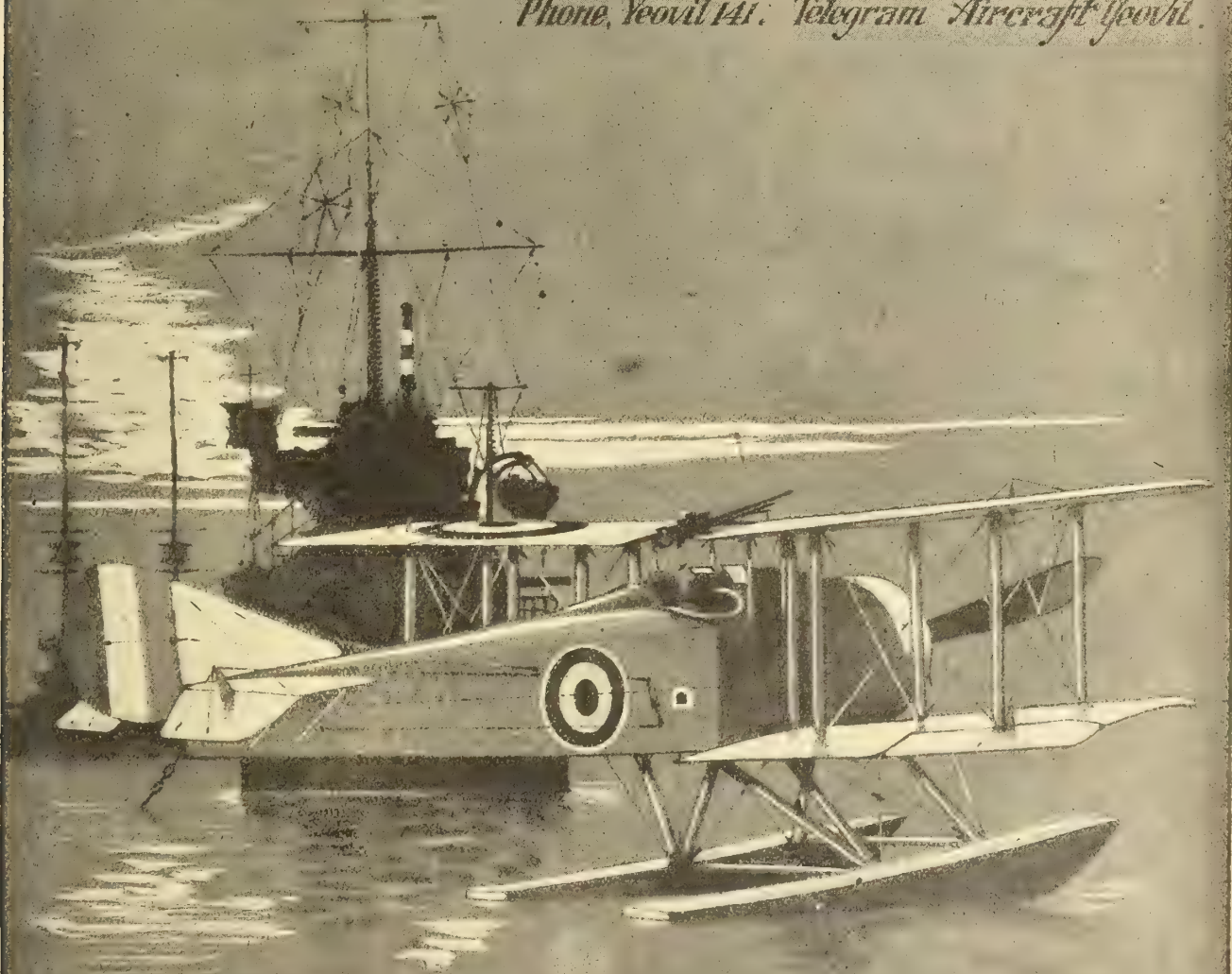
# WESTLAND *Aircraft.*

WESTLAND AIRCRAFT WORKS.

BRANCH OF PETTERS LTD.,

YEovil.

*Phone, Yeovil 141. Telegram Aircraft Yeovil.*



HARMAN ADV. CO.

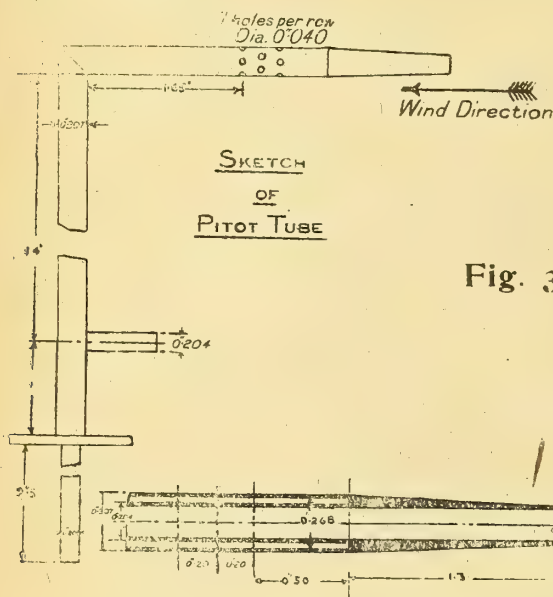


direction. The drag curves, however, cannot be made to agree by movement of one of them along the abscissae; the difference is due to the drag beam not being set along the wind direction.

As would be expected, since the difference in the drag curves is due to a component of the lift, the two drag curves cross at the angle of zero lift. The angle error can be estimated by moving one curve along the angle base by the amount indicated by the lift curves (0.2 degree) and reading off the drag from each curve at several angles. If  $L$  is the lift at any angle and  $\alpha$  the angle between the beam and the wind direction, then half the difference is equal to  $L \sin \alpha$ , and  $\alpha$  can be deduced. In this case  $\alpha$  was equal to 0.16 degree. The balance was turned through this angle by adjusting the length of the "torque stop," and the experiments repeated, using the wind direction indicated by the lift curves. The forces should now be in agreement for the two presentations of the model. The drag curve obtained after the adjustment had been made is shown dotted in the figure, and is in close agreement with the mean of the two previous drag curves.

#### MEASUREMENT OF WIND VELOCITY.

A pitot and static pressure tube of the type used by Dr. Stanton was adopted for measurement of wind velocity. The head in use at the present time is the same in principle, but has been arranged in the manner shown in Fig. 3 for convenience. This type of head has been tested on the whirling arm at the Laboratory,\* and the difference of pressure was found to be  $\frac{1}{2} \zeta V^2$ , while that in the static pressure tube was equal to the pressure of the undisturbed air in the building. The accuracy was limited by that of the test, which was the order of 0.1 per cent. on the velocity.







# AIRCRAFT MANUFACTURING COMPANY———LIMITED

Contractors to  
War Office and Admiralty

London Office

27, BUCKINGHAM GATE, S.W.1.

Offices & Works

HENDON, N.W.9.

with the increase of resistance due to the supports. The difficulty depends to a large extent on the kind of model which is under test. If the resistance of a sphere, or a square plate in normal presentation, was being investigated, it is unlikely that any appreciable error would be introduced by the assumption that the correction to be applied is given by a measurement of the resistance of the supports in the absence of the model.

In the measurement of the resistance of a "streamline" body, however, an entirely different state of affairs exists. The resistance of an airship model 6 ft. long and 0.5 ft. in diameter is in some cases only about 1/100th of that of a square plate whose area is equal to that of the maximum cross-section of the airship model. Even though such a model is supported on a spindle about 0.3 in. in diameter, an error amounting in some cases to as much as 20 per cent. of the model resistance would be introduced if this method of measuring spindle resistance were adopted.

In the test of some models several alternative methods of test are available. Thus in experiments on aerofoils the method which is usually adopted is to mount the model, with its span vertical, on a spindle screwed into its end.\* An alternative method (which was adopted by Eiffel) is to support the model with its span horizontal on a spindle screwed into, for instance, its under surface, the spindle being constructed in such a manner that the angle of incidence of the aerofoil can be varied. In this case the support can be made of "fan" form, while in the former one it turns with the model, and is therefore circular. If a low-resistance aerofoil whose span is 18 ins. and chord 3 ins. is under test, the relative values of the spindle resistance in the two cases of span vertical and the span horizontal are about 60 per cent. and 110 per cent. of the minimum drag. These high values are caused by the length of spindle which must be exposed in order that the presence of the guard may not interfere with the flow round the model.

It is therefore seen that the resistance of the spindle is nearly doubled when the span of the model is horizontal, and though this is bad enough it does not constitute the most serious objection to the method. The methods of evaluating the resistance of spindles have recently received a good deal of attention, and it has been shown that while, in the case of the spindle in the end of the model, the increase in resistance is not very different from that of the resistance of the actual spindle, there is much "interference" between the model and the spindle when the latter is attached to the under surface of the aerofoil.

It is therefore desirable, whenever possible, to test aerofoils with spindles in their ends (Fig. 4); in cases (such as experiments on wing tips) where this cannot be done, great care must be taken in the determination of the resistance due to the support.

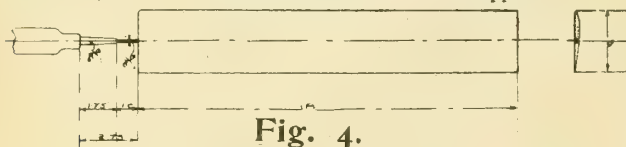


Fig. 4.

## STABILITY.

The question of stability of aircraft has been examined mathematically in considerable detail, the methods of developing the equations being laid down in Bryan's "Stability in Aviation." These methods have been developed by Mr. Bairstow, with the assistance of various members of the aeronautical staff of the Laboratory. In Report 77† the theories have been applied to the flight of an aeroplane, and were investigated for the case of an airship in 1916.

It is proposed to examine the methods which have been employed in measuring in the wind channel the various forces, moments, and damping coefficients for models of actual machines. For the purpose of stability calculation the axes are supposed to be fixed in the machine, and the nomenclature which has been adopted at the Laboratory is [See Fig. 1]:—

Name of axis.	Sym- bol.	Name of force.	Sym- bol.	Name of angle	Sym- bol.	Name of moment.	Sym- bol.
Longitudinal	X	Longitudinal	X	Roll	$\phi$	Rolling	L
Lathal	Y	Lathal	Y	Pitch	$\theta$	Pitching	M
Normal	Z	Normal	Z	Jaw	$\psi$	Jawing	N

If the centre of gravity is at  $o$ , the positive directions of the axes are as follows when the machine is in rectilinear flight in a horizontal plane:— $ox$  in the direction opposite to that of flight,  $oy$  to the left (i.e., to port), and  $oz$  vertically upwards. Forces are positive when acting along the positive directions of the axes, angles and moments are positive when turning occurs, or tends to occur, from  $ox$  to  $oy$ ,  $oy$  to  $oz$ , or  $oz$  to  $ox$ . Angular velocities about the axes  $ox$ ,  $oy$ ,  $oz$  are represented by  $p$ ,  $q$ ,  $r$ , and linear velocities along them  $x$ ,  $y$ , and  $z$ .

The rate of change of one quantity with regard to another of

which it is a function is represented, in the usual manner, by writing the symbol for the latter as a suffix to that for the former. Thus the change of pitching moment due to pitching is represented on the system of axes chosen by  $M_q$ . The writer's experience has shown it to be desirable, if mistakes are to be avoided, that a system of axes, such as the one quoted and represented in Fig. 1, should be adopted for all wind channel work, and rigidly adhered to.

The angle scale on the balance should be numbered in such a manner that rotation from  $X$  to  $Y$  increases the reading; the micrometer screw of the main moments apparatus should be graduated so that a moment which tends to turn the model from  $X$  to  $Y$  gives a reading greater than the zero. If the angle of pitch of a model is to be changed by rotation about a vertical axis, it should be mounted if possible with its under surface facing along the axis of  $Y$ . Forces, angles, and moments will now have their correct signs, except for normal force, for which the sign must be reversed. Care must be taken to correct the signs if the model is mounted in the reverse way, as is usually done in determining jawing moments on an unsymmetrical model.

*Stability* we may now consider the determination of the quantities which must be known in order that the criteria of stability of a machine may be calculated. The first operation will be to mount the model in the channel in the usual way and determine the equilibrium forces on it. These results enable us to calculate (on the assumption that the wind forces vary as the square of the velocity) the resistance derivatives for variation of wind speed.

The derivatives for variations of velocity along the axes  $Y$  and  $Z$  are given by the curves of normal and lateral force for angles of pitch and yaw. If the angle base is degrees, the value of  $Zw/U$  or  $YV/U$  is obtained by multiplying the slope of the curve near the origin of 57.3 to convert degrees to radians and dividing by the square of the wind speed.

It remains to measure the resistance coefficients due to oscillations through the equilibrium position, which have been called Rotary Derivatives.

The experimental determination of these quantities has already been described\* in connection with tests on an aeroplane model, and though the apparatus has been modified, the same methods are in use at the present time.

Measurements were made by the method of observing oscillations, and only five of the more important derivatives were considered. These were:—

The Pitching moment due to Pitching	...	$M_q$
" Rolling " " Rolling	...	$N_r$
" Yawing " " Yawing	...	$L_p$
" Rolling " " Yawing	...	$N_p$
" Yawing " " Rolling	...	$L_r$

The first three can be determined by observations of the damping of a natural oscillation, but the last two require that the model shall be oscillated about one axis while it is free to oscillate about another at right angles to it. The method was to set up an oscillation about the axis of yaw (or roll) and to adjust the period about the axis of roll (or yaw) till resonance was obtained. The motion about the first axis was then stopped and the decay of the motion about the second axis observed. The determination of these derivatives by forced oscillations was found, however, to be a matter of some difficulty, and the results can only be regarded as preliminary.

The remaining three derivatives— $L_p$ ,  $M_q$ , and  $N_r$ —were determined in the wind channel by observation of the damping of natural oscillations. The method for  $M_q$  and  $N_r$  was to mount the model on the balance in the same manner as for an experiment on the forces, the balance being free to rotate about a vertical axis. The motion was controlled by springs which maintained the oscillations for a period of from 20 to 40 seconds against the damping due to the wind forces and the friction of the apparatus. The damping of the oscillations was recorded photographically for several wind speeds.

## SCALE AND SPEED EFFECT.

In considering the application of model results there is one important correction which it is necessary to apply to the great majority of experiments in a wind channel; it is that for change of size and speed between the model and the actual machine. It has now been well established that for what may be called totally submerged bodies, such as aircraft or torpedoes, where the type of motion is determined by the viscosity of the fluid, we may write

$$F = \zeta v^2 l^2 f\left(\frac{v}{V}\right)$$

where  $F$  is the resistance to forward motion,  $v$  the velocity,  $l$  a dimension of the body, and  $\zeta$  and  $V$  the density and kinematic viscosity of the fluid. If the form of the function is unknown, we can only be sure that the motion in an experiment on a model

will be similar to that on the actual machine if the value  $\left(\frac{v}{V}\right)$

\*Rpt. Adv. Comm. for Aero., 1912-13, p. 77.

†Rpt. Adv. Comm. for Aero., 1912-13, p. 135.

\*Rpt. Adv. Comm. for Aero., 1912-13, p. 172.



# ROLLS-ROYCE

Contractors to H.M. Government.

ROLLS-ROYCE AERO ENGINES

LIKE

ROLLS-ROYCE CARS

ARE

THE BEST IN THE WORLD.

**The World's Records are held  
by Rolls-Royce Aero Engines.**

**CLIMBING.** An aeroplane fitted with **Rolls-Royce** engine holds the **World's Record for Rapid Climbing.**

**SPEED.** An aeroplane fitted with **Rolls-Royce** engine holds the **World's Record for Speed** in the air.

**RELIABILITY.** An aeroplane (Handley Page) fitted with **Rolls-Royce** engines holds the **World's Record for Long Distance Flight** under war conditions, viz.: London to Constantinople.

**WEIGHT CARRYING.** An aeroplane (Handley Page) fitted with **Rolls-Royce** engines holds the **World's Record for Weight Carrying**, viz.: London to Constantinople—total weight **Six Tons.**

**PASSENGER CARRYING.** An aeroplane (Handley Page) fitted with **Rolls-Royce** engines holds the **World's Record for carrying 21 Persons** to a height of over 7,000 feet.

ROLLS-ROYCE, Limited, 14 & 15, Conduit St., London, W.1.

Telegrams: Rolhead Reg., London.

Telephone: 1654 Gerrard (3 lines).

AND AT

PARIS. NEW YORK. PETROGRAD. MADRID and BOMBAY.

is the same in the two cases. This condition is usually unobtainable in wind channel tests, as both the size and the speed are much higher in practice; in the case of rigid airships the value of  $v$  for the actual ship is some 200 times that in the model test. By carrying out tests in water  $v$  can be reduced to  $1/14$ th that of air, but the experimental difficulties then become very great and in most cases outweigh the advantages of an increase

in the value of  $\left(\frac{v}{V}\right)$ . Experiments on full-scale machines are

admittedly extremely difficult, and it is only recently that they have been carried out on aeroplanes. It is hoped that in the near future resistance experiments on full-size airships will be made.

Experiments on models over the greatest possible range of speed appear, in many cases, to indicate that the power of the velocity which the resistance varies

at is not very different from 2 at the highest value of  $\left(\frac{v}{V}\right)$  obtainable. If  $F \propto V^2$ , then  $f\left(\frac{v}{V}\right) = 1$ , and we can calculate the

forces on the actual machine directly from our model experiment.

A very large amount of data has been obtained in testing the aeroplanes which are being constructed for our naval and military forces, and comparisons of the greatest value are now possible between the results on models and actual machines. The writer believes that the time is not far distant when the design of new machines will be essentially based on the results obtained in experiments on small-scale models in a wind channel.

It was the author's good fortune to be associated for some years with Mr. Leonard Bairstow, F.R.S., who was until recently the Senior Assistant in the Aeronautical Division of the National Physical Laboratory. The progress which has been made was due in a very large measure to his personal ability and to the sympathetic encouragement which led to such close co-operation between the members of the staff who worked under him.

In conclusion, the author desires to thank the Advisory Committee for Aeronautics for permission to publish the information contained in the paper; he is also indebted to Sir Richard Glazebrook, F.R.S., for the facilities he has granted in connection with the preparation of the diagrams and lantern slides.

#### THE DISCUSSION.

Some notes on the discussion which followed the lecture appear hereafter. Sir Richard Glazebrook remarked that he was sure the audience would agree as to the value of Mr. Pannell's paper. The lecturer had had great experience in the use of air channels and understood the precautions which must be taken to secure accuracy. Although he had given freely of his knowledge it would be understood that under present conditions it was impossible to say things quite so freely as in happier times. Air channels were of great value and importance, and their number were being increased throughout the country, and any help which the staff of the N.P.L. could offer would be given. Even if Mr. Pannell had limited his paper to the scope of the first section, in which appeared the history of existing air channels, their construction and use, it would have been a valuable addition to the knowledge of those present and very well worthy of a separate lecture. He had done much more than that and had demonstrated the difficulties which occur in their use.

In particular he appreciated Mr. Pannell's insistence on the need for extreme care and accuracy in all measurements. [A point worthy of commendation.—Ed.] Figures which he had given showed the nature of the accuracy which was obtainable, and also the kind of error which might be introduced into measurements. In dealing with the error which might be introduced by erroneous methods of calculating the resistance of the spindle upon which the model was supported, he had pointed out how the resistance was sometimes 60 per cent., and occasionally over 100 per cent., of the actual resistance of the model which was being measured.

He felt that great honour was due to those gentlemen who devoted so much time and attention to attempting to carry out on real aeroplanes experiments which would enable them to determine what the scale effect was, and what alterations were necessary in stepping from the model to the full-scale work.

Lieut.-Col. R. de Villamil took exception to the lecturer's employment of the word "velocity," which he regarded as loose. He disagreed that it was a matter of indifference whether a body was in motion and the air at rest, or *vice versa*. He maintained that the relative motion was not the same, and defined velocity as opposed to speed. He approved of the whirling table rather than of the wind channel.

He referred to experiments made by Cailletet and Colardeau, who in dropping plates weighted with small weights from the Eiffel Tower obtained "terminal velocities," beyond which the velocities were uniform. In similar experiments by M. Eiffel the plates were accelerated by very heavy weights, and accele-

rated to the end of the fall. The dimensional effect was very marked in the latter, but absent in the former experiments.

Mr. L. Bairstow, O.B.E., thought that models made it easy to analyse the nature of a fault in design, because whereas a full-sized machine could not be dissected in mid-air to determine which particular part was giving trouble, this could be done with a model in a wind tunnel. [A very sound argument.—Ed.]

Captain H. Grinstead was somewhat doubtful whether model results could with safety be applied directly to full-scale work.

Professor Macgregor Morris asked for information on the pulsations which occurred in wind tunnels, and the effects of the rebound of the airstream which was deflected by the model on to the sides of the tunnel. Had it been shown by experiment if when the same model was treated in a 4ft. and 7ft. channel there was the same lift at the same angle?

Mr. Norman Piercy said that the first tests that were made in the East London wind tunnel, the lift-to-drag ratio of a small model was found to vary by as much as 12 per cent. according to whether it was placed right way up or upside down. It was found, however, that the tunnel was defective as constructed and adjustments cured the discrepancy.

Mr. Pannell in reply to the discussion said that the experiment in dropping plates down the Eiffel Tower were in agreement with those made on 10ft. square boards at the N.P.L. He had no figures about fluctuations in the channel.

In testing aerofoils in 7ft., 4ft., and 3ft. channels the results were in agreement.

General Ruck moved a vote of thanks to Sir Richard Glazebrook and to Mr. Pannell, which was carried unanimously.

#### L'UNION FAIT LA FORCE.

The registration as a private limited company of the firm of DelaCombe, Maréchal and Hervieu, Ltd., has recently been recorded, and this seems a fitting opportunity to put on record something of the work done by this firm. The origin of the firm dates from a period some years before the war, when Mr. Harry DelaCombe, formerly an officer in the Royal Navy, and one of the first people in this country to take an active part in aeronautics, joined with M. Pierre Maréchal in representing the Borel aeroplanes in this country.

A number of Borel monoplanes, fitted with floats, were bought by the R.N.A.S., then known officially as the Naval Wing, R.F.C. Despite the fact that they were monoplanes, and had only 80 h.p. Gnome engines, these little machines did surprisingly good work, and had highly educative influence.

Thereafter the firm's activities increased very considerably, and a number of novelties in connection with aeronautics were introduced by the firm from France, included among them being the Hervieu portable aeroplane shed, invented by M. Hervieu, himself one of the best known balloonists in France, and an airship pilot of note. These Hervieu *hangars démontables* were demonstrated to the R.F.C., and were described in detail in this paper at the time. Among the other implements of note introduced by the firm were the F.B.A. boats, now so well known both to the R.N.A.S. and to the enemy.

At the outbreak of war, Mr. Harry DelaCombe joined the R.N.A.S., and it was largely through his instrumentality that kite-balloons were introduced into the British Flying Services. On joining the Service he severed his active connection with the firm and devoted himself to lighter-than-air craft with such good effect that he is now Wing Commander, R.N.

M. Pierre Maréchal has been connected with aviation since its very early days, and is an intimate friend of all the pioneers of French aviation, both constructors and pilots alike. He is equally popular and equally well known on French aerodromes and in the best French Society, and he is certainly no less popular with Service people and in the Aircraft Industry in this country. As a sportsman and as a business man he represents all that is best among our gallant Allies across the Channel, and though not educated as an engineer, his technical knowledge of everything pertaining to aviation surpasses that of many who pose as experts.

For a considerable time M. Maréchal carried on the business very successfully by himself, but on the adoption by the British Government of the Hervieu airship sheds, which, after a while, came to be manufactured in England, M. Hervieu himself became a partner in the firm, devoting his attention specially to the portable shed branch of the business.

To-day the firm is of very considerable importance in the production of war material, and besides actually supplying material the partners have been of very great value in keeping the French and British Authorities thoroughly in touch with the developments in one another's countries to the mutual advantage of the respective Flying Services. In fact, as entirely unofficial liaison officers, they really deserve the gratitude of both nations.

The enormous growth of the firm's business has necessitated the turning of the partnership into a limited company, and the many friends of all the partners will wish the new development every success.





**CELLON**  
- NON-POISONOUS -  
**DOPE**

**CELLON, LTD.,**  
Broad Street House, E.C. 2.  
Telephones: London Wall 5359, 8622.  
Telegrams: "AJAWB London."

**CELLON WORKS**

GEOFFREY WATSON 1917



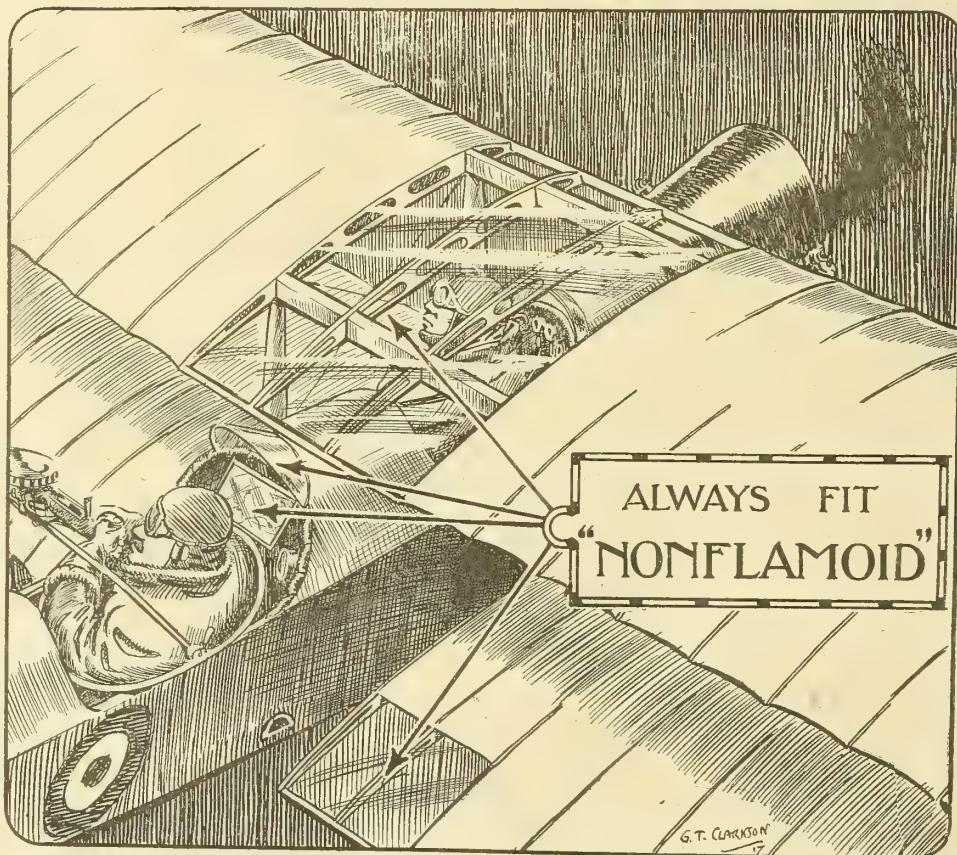
# "NONFLAMOID"

REGISTERED

NON-INFLAMMABLE CELLULOID  
FOR  
WIND SHIELDS, WING COVERINGS  
OBSERVATION PANELS, & MAP COVERS

## SPECIAL NOTICE.

We have on hand a considerable quantity of "Nonflamoid," in strips, 48in. x 7in., and can consequently give immediate delivery of Windscreens or Panels of dimensions not exceeding the above.



## The LONDON LABEL CO., Ltd.

*Contractors to H.M. Government,*

**HARLEY WORKS, BECKTON ROAD,  
LONDON, E.16.**

Phone—East 1300.

Telegrams—Lonlabel, Canning, London

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



**WOODSIDE ENGINEERING COMPANY, LTD.,  
POSSILPARK, GLASGOW.**

# **AEROPLANE TIERODS**

: IN :

**STREAMLINE AND ROUND SECTIONS**

COMPLETE WITH

**UNIVERSAL OR FORK JOINTS**

**LARGE STOCKS.**

**PROMPT DELIVERY.**

**Telephones.**

**WORKS: 1495 Douglas (2 lines.)**

**OFFICE: 3456 Central (3 lines.)**

(Private Branch Exchange.)

**Telegrams: "FUSELAGE," GLASGOW.**

**Registered Office**

**50 WELLINGTON STREET,  
GLASGOW.**

# AEROPLANE COMPONENTS.

TRADE MARK.



MEANS LONG LIFE

If you are building or tendering for Aeroplanes write for our list.

It contains 300 full-size sectional illustrations of Weldless Steel Tubing, Reproductions of Component Parts, and Valuable Information.

We hold tools for parts of the following machines:—

**B.E. 2, C.D.E. and B.E. 12, R.E. 7 and 8.**

**F.E. 2 B. and D., F.E. 8, S.E. 5, AVRO,**

**BLERIOT, H. FARMAN,**

**SOPWITH (110 H.P. Clerget and F1.).**

We make and manipulate Weldless Steel Tubing, and produce Presswork in Sheet Steel to all Air Board Specifications.

With the approval of the Aero. Supplies Department, we are now making Tubes for Axles, having ends polished to size, thus saving the expense of grinding. May we send you particulars, and also

**THAT EXCEEDINGLY USEFUL LIST ?**

Telegrams:

"Accles,  
Oldbury."

A.B.C. Code,  
5th Edition.



Telephones:

Oldbury, 111.

(4 Lines.)

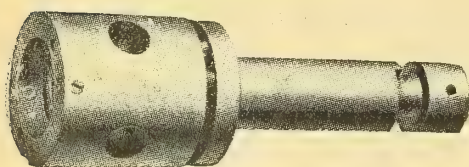
OLDBURY,

BIRMINGHAM.

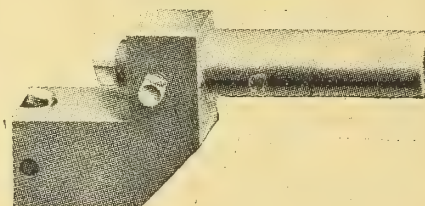
## CAPSTAN LATHE EQUIPMENT

**For Machining of Strainers, Eyebolts,  
Fork Joints, Turnbuckles, etc., etc.**

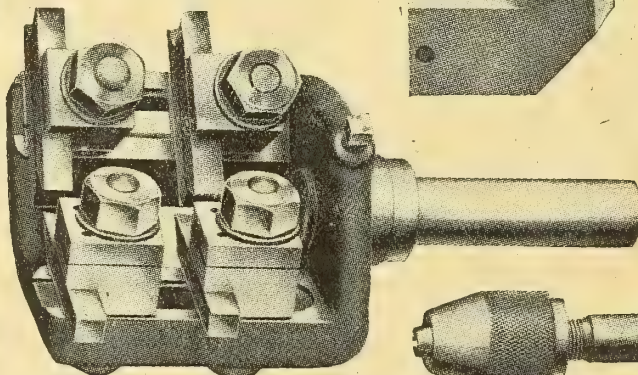
Self-releasing Die Holder.



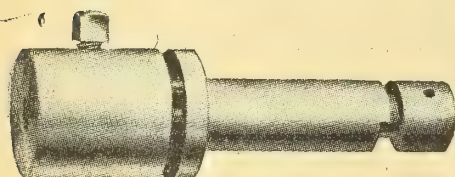
Knee Tool Holder.



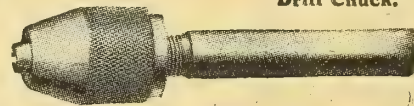
Box Tool Holder.



Self-releasing Tap Holder.



Drill Chuck.



SPRING COLLETS, HOLLOW MILL HOLDERS, FACE FORM TOOL HOLDERS, ADJUSTABLE STOPS, &c., &c.

**IMMEDIATE DELIVERY.**

**HENRY J. BREWSTER & Co.,**

Works: Goodmayes, Essex.

11, QUEEN VICTORIA STREET, E.C.4.

Phone: CITY 788.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



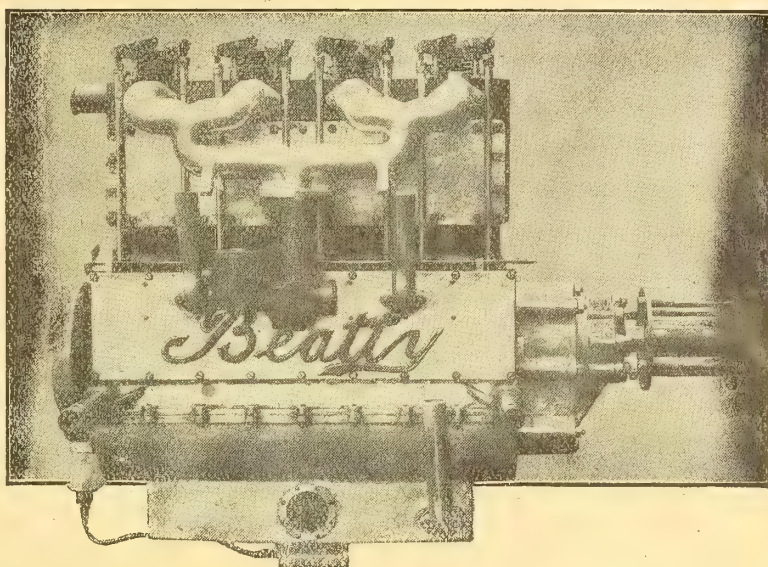
# The Beatty Monobloc Aero E

H.P. = 60.

R.P.M. = 1800  
Engine Shaft.

Prop. speed =  
1200 R.P.M.

Weight = 225 lbs



*Specially Designed and Developed for School Work.*

FULL  
PARTICULARS **The Beatty School of Flying Ltd.** A  
Telephone . . . . Kingsbury 138.

Contractors to H.M. Admiralty, War Office and Foreign Governments.

## The BRITISH CAUDR CO. LTD.

SOLE BUILDING AND SELLING RIGHTS FOR

**Caudron Aeroplanes  
and Hydro-Aeroplanes**

FOR

**THE BRITISH EMPIRE AND DEPENDENCIES**

*Head Office and Works:*

**BROADWAY, CRICKLEWOOD, N.W.2.**

Cable and Telegraphic Address: "CAUDROPLAN, CRICKLE, LONDON." Phone: 4647 H  
4648 H

*Scottish Factory and Aerodrome:*

**ALLOA.**

Cable and Telegraphic Address: "CAUDROPLAN, ALLOA." Phone:



**Engineering and Experimental**

Aviation Co. "Alromnia,  
Gerrard 278 (2 lines).

**Welding Plant—**

Corporation of Great Britain, Ltd.,  
Victoria Street, Westminster,  
"Flamma, Vic. London." Vic 4830.  
Light, Ltd., 123, Victoria Street, Lon-  
don. "Edibrac, Phone, London."  
3540 Victoria (3 lines).

**Manufacturers—**

Manufacturing Co., Ltd., Hendon.  
Hyde, London.

Kingsbury 180.  
Sir W. Whitworth & Co., Ltd.,  
London-Tyne. "Armstrong Aviation,  
London-Tyne." Gosforth 500.  
Aeroplane & Motor Co., Ltd.,  
Leeds "Propellers, Leeds."

Roundhay 345 (3 lines).  
Paul, Ltd., Rose Lane Works,  
"Aviation, Norwich." Norwich 851.  
Colonial Aeroplane Co., Ltd. (The  
Co.), Filton, Bristol. "Aviation,  
Bristol 3906.

Iron Co., Ltd., Broadway, Crickle-  
wood, N.W.2. "Caudroplan, Crickle-  
wood." Hampstead 5551.  
raft Co., Palmerston Works, High  
Kilburn, N.W.6. "Aviduction,  
London." Hampstead 4403 and 4404

Aviation Co., Ltd., Hammersmith,  
Hammersmith 1144-1145  
Aviation Co., Ltd., Eastbourne.  
"Eastbourne." Eastbourne 1176.

White Aviation Co., Ltd., London  
me, Hendon. "Volplane, Hyde,  
Kingsbury 120.  
Page, Ltd., 110, Cricklewood Lane,  
Hydrophid, Crickle, London." Hampstead 7420.

gerton & Co., Aircraft Works, Nor-  
"Motors, Norwich."  
Norwich 482 (4 lines).  
s, Ltd., Brooklands, Byfleet.  
tinsyde, Weybridge.

Aircraft Co., Ltd., 15, Hackney Road,  
London Wall 6725.  
" & General Aircraft Co., Crickle-  
wood, N.W.2. "Neuscut,  
London." Willesden 2455.

ompson Flight Co., Ltd., Bognor.  
ng, Bognor. Bognor 48.  
t Carriage Co., Ltd., 126/132, New  
Road, Fulham, S.W.6. "Carbodies,  
Putney 2240-2241.

, & Co., Ltd., Inchester. "Tri-  
Manchester."  
City 8530-8531, Manchester.  
S. E., Ltd., East Cowes, I.O.W.  
ita, East Cowes." Cowes 193.

os., Rochester, Eastchurch and  
all House, S.W. "Tested, Phone,  
n." Regent 378.  
Aviation Co. Ltd., Kingston-on-  
es. "Sopwith, Kingston." Kingston 744.

Aircraft Manufacturing Co., Effing-  
House, Arundel Street, W.C.2  
esignrush, Estrand, London." City 89.  
Ltd., Imperial Court, Basil Street,  
tsbridge, S.W.3. "Vickerlyta,  
ts, London." Kensington 6810.

ts, Gillow, Ltd., Hammersmith,  
zen, Ox, London." Museum 5000.  
Aircraft Works, Yeovil. "Aircraft,  
Yeovil 129.

Samuel, & Co., Ltd., East Cowes.  
e, East Cowes." Cowes 3.  
Aircraft (1917), Ltd., Richmond Sur-  
"Whitcraft, Richmond, Surrey." Richmond 1865.

JS—Wimbledon 1314.  
s, Ltd., High Street, Merton.  
Bros., Rochester, Eastchurch, and White-  
House, S.W. "Tested, Phone, Lon-  
don." Regent 178.

um Castings (Sand & Die)  
R. W., 219, Goswell Road, London,  
"Krankases, Isling, London." City 1846.

s (Etonia Cast Phosphor  
e)—  
Engineering Supplies, Ltd., Wortley,  
"Yes, Leeds." Central 3927.

heets for Tipping Pro-  
rs—  
Co., 46, Fenchurch Street, London,  
"Poetry, Fen, London." Avenue 995, 996, and 7006.

gs—  
& Paul, Ltd., Rose Lane Works,  
Norwich. "Aviation, Norwich."  
Norwich 851.  
r, T. W. & Co., Church Road, Merton  
Surrey. Wimbledon 1313

Owen & Co., Darlaston, South Staffs.  
Hiley Co., Ltd., Salisbury House, Lon-  
don Wall, E.C.2. "Wrathless, Phone,  
London." City 2681-2

Coverings and Cable  
ntrols—  
Terry & Sons, Ltd., Redditch.  
ngs, Redditch." Redditch 61.  
n Work—  
& Co., 4 and 5, A B Row, Birming-  
ham. "Gabriel, Birmingham." Central 1223.

**Carburettors—**

Hobson, H. M., Ltd., 29, Vauxhall Bridge  
Road, S.W.1. Victoria 4670.

**Casein—**

Nieuwhof, Surie & Co., Ltd., 5, Lloyds Avenue  
London, E.C.3. "Surie don, Fen London." Avenue 34 & 35.

**Castings—**

Gabriel & Co., 4 and 5, A B Row, Birming-  
ham. "Gabriel, Birmingham." Central 1223.

**Castings (Aluminium, Brass, Bronze, Machined or Rough)—**

Gabriel & Co., 4 and 5, A B Row, Birming-  
ham. "Gabriel, Birmingham." Central 1223.

**Celluloid (Non-Flam.)—**

Greenhill & Sons, 8, Water Lane, E.C.  
"Greenberg, London." Central 1306-7.  
London Label Co., Beckton Road, E.16. "Lon-  
label, Canning, London." East 1300.

**Clothing—**

Burberry's, Ltd., Haymarket, S.W.1.  
Regent 2165.  
Dunhill's Ltd., Euston Road, N.W.1. "Dun-  
send, London." North 3405-6.

**Component Parts—**

Acclies & Pollock, Ltd., Oldbury, Birmingham.  
"Acclies, Oldbury." Oldbury 111 (4 lines).  
B. D. V. Aircraft Spares, Syon Chambers,  
16a, Kew Road, Richmond, Surrey. "Aeros,  
Richmond." Richmond 1681.

Central Aircraft Co., Palmerston Works,  
High Rd., Kilburn, N.W.6. Hampstead, 4728.  
"Aviduction, Phone, London."  
Evans, Joseph, & Co., Ltd., Liverpool Street  
Mills, Birmingham. "Adept, Birming-  
ham." Central 733 (3 lines).

The Aircraft Construction Co., Harley Works,  
Beckton Road, E.16. "Aeracracons, Can-  
ning, London." East 1300  
Thompson Bros. (Bilston), Ltd., Bradley, Bil-  
ston, England. "Thompson Bros., Bilston." Bilston 10.

**Cords, Tapes, and Threads—**

MacLennan, J., & Co., 30, Newgate Street,  
E.C.1. And at Glasgow. City 3115.

**Dopes—**

British Aeroplane Varnish Co., Ltd., 166, Picca-  
dilly, W.1. "Tetrafree, Piccy, London." Gerrard, 2312.  
British Cellulose Co., 8, Waterloo Place, S.W.1.  
"Cellulite, London." Regent 4046.

The British Emallite Co., Ltd., 30, Regent  
Street, S.W.1. "Ridleyren, Piccy, Lon-  
don." Gerrard 280.  
Cellon, Ltd., Broad Street House, New Broad  
Street, E.C.2. "Ajawb, London." London Wall 5350-3622.

Clark, Robert, Ingham & Co., Ltd., Walter  
House, Bedford Street, Strand, W.C  
"Pearline, Westrand." Regent 3923

**Electrical Accessories—**

Johnson & Phillips, Ltd., Charlton, London,  
S.E.7. "Juno, London." Central 2207, London Wall 1564.  
Mann, Egerton & Co., Ltd., 177, Cleveland  
Street, London, W.1. "Installing, Eus-  
road, London." Museum 70.

Premier Electric Heaters, Ltd., 258, 259, and  
360, Bradford Street, Birmingham. "Fah-  
renheit, Birmingham." Midland 081.  
The Rotax Motor Accessories Co., Ltd., Vic-  
toria Road, Willesden Junction, N.W.10.  
"Rodynalite, Phone, London." Willesden 2480.

**Electric Cables—**

E. Kalker & Co., Coventry. "Kalker, Coventry."  
Coventry 24X.  
Johnson & Phillips, Ltd., Charlton, London,  
S.E.7. "Juno, London." Central 2207, London Wall 1564.

**Electric Lighting and Power—**

E Stanley Fardon, A.M.I.E.E., 67, Mosley  
Street, Manchester.  
Johnson & Phillips, Ltd., Charlton, London,  
S.E.7. "Juno, London." Central 2207, London Wall 1564.

**Engines and Parts—**

Allen, W. H., Son & Co., Ltd., Queen's En-  
gineering Works, Bedford. "Pump, Bed-  
ford." Bedford No. 1.  
Arrol-Johnston, Ltd., Dumfries. "Mocar, Dum-  
fries." Dumfries 281-282.

The Beatty School of Flying, Ltd., The Broad-  
way, Cricklewood, N.W.2. Hampstead 3000.  
Beardmore Aero Eng., Ltd., 112, Great Port-  
land Street, W.1. "Beardmore, London." Gerrard 238.

Dudbridge Iron Works, Ltd. (Salmson), 87,  
Victoria Street, London S.W.1. "Aero-  
flight, Vic, London." Vic 7026.  
Evans, Joseph, & Co., Ltd., Liverpool Street  
Mills, Birmingham. "Adept, Birming-  
ham." Central 733 (3 lines).

Gordon Watney & Co., Ltd., Weybridge.  
"Mercedés, Weybridge." Weybridge 550 (7 lines).  
Green Engine Co., Ltd., Twickenham.  
Richmond 1203

Gwynnes, Ltd., Hammersmith Iron Works,  
Hammersmith, W. "Gwynne, Ham-  
mersmith." Hammersmith 1010.  
Napier & Son, D., Ltd., 14, New Burlington St.,  
London, W., and at Acton, W. "Nitrifur,  
London." Gerrard 89.

Robertson, J. H., & Co., 1, Albemarle Stre,  
London, W.1. Regent 3000.

**THE AEROPLANE**

**Engines and Parts (continued)—**

Rolls-Royce, Ltd., 14 and 15, Conduit St., W.1.  
"Rollhead, London." Gerrard 1654-5-6.  
The Selsdon Aero & Engineering Co., Ltd.,  
Imperial House, Kingsway, W.C.2. Regent 1181.

Sturtevant, B. F., Co., Ltd., Hyde Park, Boston,  
U.S.A.  
Sunbeam Motor Car Co., Ltd., Wolverhampton.  
"Moorfield, Wolverhampton." Wolverhampton 985.

The Gnome & Le Rhône Engine Co., Ltd.,  
47, Victoria Street, S.W. "Elevenfold,  
London." Walthamstow 408 (2 lines).

**Flare Lights—**

Imperial Light, Ltd., 123, Victoria Street, Lon-  
don, S.W.1. "Edibrac, Phone, London."  
3540 Victoria (3 lines).

**Flexible Shafts—**

Herbert Terry & Sons, Ltd., Redditch.  
"Springs, Redditch." Redditch 61.

**Flying Schools—**

Bournemouth Aviation Co., Ltd., Talbot Vil-  
lage, Bournemouth. "Etches, Winton." Bournemouth 1160.

**Furniture (Office)—**

Cooke's (Finsbury), Ltd., Finsbury Pavement  
House, London, E.C.2. London Wall 573 and 6179.

**Galvanising—**

Boulton & Paul, Ltd., Rose Lane Works,  
Norwich. "Aviation, Norwich." Norwich 851  
The Rustless Iron (Cowper Coles Process),  
Ltd., 1, French St., Sunbury-on-Thames,  
Middlesex. Sunbury 37.

**Gears—**

Moss Gear Co., Ltd., Thomas Street, Aston,  
Birmingham. "Mosgear, Birmingham." East 407.

**Glue—**

Central Chemicals, Ltd., 283, West End Lane,  
London, N.W.6. "Entramical, Westham-  
p." London.  
Improved Liquid Glues Co., Ltd., Gt. Hermi-  
tage Street, E. (Croid.). "Excroiden,  
Wapp, London." Avenue 3178.

Mendine Co., 8, Arthur Street, E.C. Bank 5873.  
Oldroyd, Wm., & Sons, Ltd., 9, Mincing Lane,  
E.C.3.

**Goggles—**

Triplex Safety Glass Co., Ltd., 1, Albemarle  
Street, Piccadilly, W.1. "Shatterlys, Piccy,  
London." Regent 1340.

**Heating and Ventilating—**

Chas. P. Kinnell & Co., Ltd., 65 & 65a  
Southwark Street, London, S.E.1. "Kinnell,  
London." Hop 372 (2 lines).

**Hollow Spars—**

McGruer Bentwood Hollow Spar Co., Com-  
mercial Wharf, Lameth, S.E. "Gabriel-  
son, Watloo, London." Hop 718.  
Robert Young Construction Co., Ltd., Canon-  
bury Works, Canonbury Street, Essex Rd.,  
London, N.1.

**Instruments—**

British Wright Co., Ltd., 33, Chancery Lane,  
W.C.2. Holborn 1308.

**Instruments (Scientific, Alti-  
meters, etc.)—**

The Cambridge Scientific Instrument Co., Ltd.,  
Cambridge. "Instrument, Cambridge." Cambridge 642  
Short & Mason, Ltd., Macdonald Road,  
Walthamstow, E.17. "Aneroid, Phone,  
London." Walthamstow 180.

**Machine Tools—**

Brewster & Co., 11, Queen Victoria Street,  
E.C.4. "Circumfuse, Cannon, London." City 768.

**Magneto Driving Pieces—**

Herbert Terry & Sons, Ltd., Redditch.  
"Springs, Redditch." Redditch 61.

**Magnetos—**

The M-L Magneto Syndicate, Ltd., Victoria  
Works, Coventry. "Corlton, Coventry." Coventry 1008-1009.  
The British Lighting & Ignition Co., Ltd.,  
204, Tottenham Court Road, W.1. "Vicks-  
mag, Phone, London." Museum 430.

**Metal Manufacturers—**

Clifford, Chas., & Sons, Ltd., Birmingham.  
"Clifford, Birmingham." Central 42-43.  
Evans, Joseph, & Co., Ltd., Liverpool Street  
Mills, Birmingham. "Adept, Birming-  
ham." Central 733 (3 lines).

**Metals in General—**

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3.  
Samuel Mercer & Co., 198, Upper Thames  
Street, E.C.4. "Reconciled, Cannon, Lon-  
don." City 6342.  
Pritt & Co., 46, Fenchurch Street, London,  
E.C.3. "Poetry, Fen, London." Avenue 995, 996, and 7096.

**Metal Parts and Fittings—**

Acclies & Pollock, Ltd., Oldbury, Birmingham.  
"Acclies, Oldbury." Oldbury 111 (3 lines).  
Aircraft Supplies Co., Ltd., Ascol House, 125,  
Long Acre, W.C.2. "Upcast, Rand,  
London." Gerrard 276 (2 lines).

Arnott & Harrison, Ltd., Hythe Road, Will-  
den Junction. Willesden 2207.  
Bayliss, Jones & Bayliss, Ltd., Wolverhampton.  
(Bolts and Nuts.) "Bayliss, Wolverhampton." Wolverhampton 1041.



# DIYERS' GUIDE

## Metal Parts and Fittings (contd.)—

The Birmingham Guild, Ltd., 45, Gt. Charles Street, Birmingham. "Handicraft." Central 3705.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

The British Gold Shell Ring Co., Ltd., Inverness Road, Hounslow, London. "Golshel, Hounslow." Hounslow 254.

British Metal (Kingston), Ltd., Kingston-on-Thames. "Motors, Norwich." Norwich 482 (4 lines).

Guthrie J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1472.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Euston Road, London." Museum 70.

Mountford, Fredk., Ltd., Fremo Works, Lifford, Birmingham. "Fremo, Birmingham." Kings Norton 261.

Robertson, J. H., & Co., 1, Albemarle Street, London, W.1. Regent 3996.

Rubery, Owen, & Co., Darlaston South Staffs. Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66.

The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. Regent 1181.

The Aircraft Construction Co., Harley Works, Beclton Road, E.16. "Aeracracons, Canning, London." Fast 1300.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston." Bilston 10.

Wooler Engineering Co., Ltd., Old Oak Common Lane, Willesden Junction, N.W.10.

**Metal Shearing Tools—** Montgomery, Smith, & Co., Ltd., Tangent Works, Keynsham, near Bristol. "Ingenuity, Saltford." Keynsham 21.

**Metal Spinnings—** Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

**Metric Bolts—** Cashmore Bros., Zota Works, Hildreth Street, Balham, S.W. Battersea 415.

Rubery Owen & Co., Darlaston, South Staffs.

**Miscellaneous—** Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast." Belfast 4033-4034-4035.

Anti-Glare Glass Co., Ltd., 76, Turnmill Street, E.C. Central 3731.

Bowden Wire, Ltd., Willesden Junction, "Bowirelim, Harles, London." Willesden 2400 (3 lines).

British Metal (Kingston), Ltd., Kingston-on-Thames. "Motors, Norwich." Norwich 482 (4 lines).

Brown Bros., Ltd., Great Eastern Street, E.C.1. "Imbrowned, Bethroad, London." London Wall 6300.

Endolithic Manufacturing Co., Ltd., 613, Fore Street, London, E.C.2. Labels in Metal, Ivory, Ivoring, etc.

Herbert Froid Co., Ltd., Chapel-en-le-Frith. "Frodobralke, Birmingham." Central 793.

Glasso Manufacturing Co., Ltd., 211, City Road, E.C. City 9558.

London Label Co., Ltd., Harley Works, Beclton Road E.16. "Nonflamoid" Nonflammable Celluloid. "Lonlabel, Canning, London." East 1300.

MacLennan, J., & Co., 30, Newgate Street, E.C.1, and at Glasgow. Tapes, Cords and threads. City 3125.

**Motor Cars—** Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

Mann, Egerton & Co., Ltd., 379/381, Euston Road, London, N.W.1. "Manegear, Euston Road, London." Museum 70.

Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 530 (4 lines).

**Nameplates and Labels—** British Metal (Kingston), Ltd., Kingston-on-Thames. "Motors, Norwich." Norwich 482 (4 lines).

Endolithic Manufacturing Co., Ltd., 613, Fore Street, London, E.C.2. Labels in Metal, Ivory, Ivoring, etc.

The Clegg Metal Engraving Co., Chatsworth Works, Worthing. "Clegg Worthing."

**Observation Panels—** Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterly, Piccy, London." Regent 1340.

E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemalivo, Ave, London." London Wall 3266-3267.

**Pattern Making—** Fredk. Ward, 6, 7 and 8, Allsop Street, Upper Baker Street, W. Padd 4743.

**Piston Rings—** British Chuck & Piston Ring Co., Coventry. "Rings, Coventry." Coventry 723.

**Power Presses and Dies—** Bliss, E. W., & Co., 23, Pockock Street, Blackfriars Road, London, S.E.1. "Blissdon, London." Hop 4340.

**Presswork—** Rubery Owen & Co., Darlaston, South Staffs. Terry Herbert & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Propellers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames. "Ebora, Kingston." Kingston 672.

Integral Propeller Co., Ltd. "Avioprop, Hyde, London." Hendon 9. Kingsbury 104.

Lang Propeller, Ltd., Weybridge. "Aerosticks, Weybridge." Weybridge 520-521.

Mann, Egerton & Co., Ltd., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Oddy, W. D., & Co., Leeds. "Airscrews, Leeds." Central 291, Leeds.

Stanley Aviation Co., 67, Kingsland Road, E.2. City 8347.

Westland Aircraft Works, Yeovil. "Aircraft, Yeovil." Yeovil 129.

**Pyrometers—** The Foster Instrument Co., Letchworth, Herts. Foster Instruments, Letchworth, Letchworth 26.

**Rigging for Aircraft—** Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466 (3 lines).

**Rubber Tubing & Accessories—** Hancock, James Lyne, Ltd., 266, Goswell Road, London, E.C.1. "Masticator, Isling, London." City 3811 and 3812.

**Safety Belts—** Holmes, C. H., & Son, 38, Albert Street, Manchester. "Semloh, Manchester." City 4432.

**Seaplane Manufacturers—** Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

Mann, Egerton & Co., Ltd., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

The Norman Thompson Flight Co., Ltd., Mid-dieton, Bognor. "Soaring, Bognor." Bognor 48.

Short Bros., Rochester. "Seaplanes, Rochester." Chatham 627.

Supermarine Aviation Co., Ltd., Southampton. "Supermarine, Southampton." Southampton 1337.

**Searchlights and Landing Lights—** Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

**Seats for Aeroplanes—** Bowser, E., Art Cane Works, 50 Park Lane, Leeds. Central 3473.

**Shackles—** The British Gold Shell Ring Co., Ltd., Inverness Road, Hounslow. "Golshel, Hounslow." Hounslow 254.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

**Sheet Metal Pressings—** Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

Blackburn Aeroplane and Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345.

W. H. Briscoe & Co., Ltd., 51 and 52, Park Street, Birmingham. "Brisk, Bham." Central 550.

British Metal (Kingston), Ltd., Kingston-on-Thames. "Motors, Norwich." Norwich 482 (4 lines).

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

London Aluminium Co., Ltd., Westwood Road, Aston, Birmingham. East 497 Birmingham.

Rubery Owen & Co., Darlaston, South Staffs.

**Sheet Metal Work—** British Metal (Kingston), Ltd., Kingston-on-Thames. "Motors, Norwich." Norwich 482 (4 lines).

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Rubery Owen & Co., Darlaston, South Staffs.

The Acetylene Corporation of Great Britain, Ltd., 40, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.

The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. Regent 1181.

Arthur Hill & Co., Silchester Road, North Kensington, W. Park 1443.

**Shock Absorbers (Elastic Cord)—** Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

**Sparking Plugs—** Lodge Sparking Plug Co., Ltd., Rugby. "Igniter, Rugby." Rugby 235.

Ripault, Leo, & Co., Ltd. (Oleo Plugs), 644, Poland Street, W.1. "Ripault, Reg, London." Gerrard 7758.

**Springs—** Dart Spring Co., West Bromwich. "Dart, West Bromwich." West Bromwich 322.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61 (3 lines).

## Stampings—

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1472.

**Steel—** Firth, Thos., & Sons, Sheffield. "Steel, Sheffield." Sheffield 2.

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1472.

Nicklin, Bernard, & Co., Birmingham. "Nicklin, Birmingham." Birmingham 10.

**Steel Tension Wires—** Cradock, Geo., & Co., Ltd., Wakefield. "Cradock, Wakefield." Wakefield 466.

**Steel Tubes for Aeroplanes—** Accles & Pollock, Ltd., Oldbury, W. "Accles, Oldbury." Oldbury 111.

**Taper Pins—** Mountford, Fredk. (Birmingham), L. Works, Lifford, Birmingham. "Lifford, Birmingham." Birmingham 10.

**Tapes and Smallwares—** Brown, Percy, & Co., 49, Newgate Street, London, E.C.1. "Ominate, Central 3705."

MacLennan, John, & Co., 30, Newgate Street, E.C.1. And at Glasgow.

James North Hardy & Son, Ltd., 54, Street, Manchester. "Hardson, Manchester." Manchester 10.

**Timber—** Engineering Timber Co., Ltd., Street, London, S.W. "Entikosi, London." Victoria 10.

Brown, R. F., & F. W., Wollaton near Nottingham. "Brown's, Wollaton." Nottingham 10.

J. Owen & Sons, Ltd., 199a, B Street, S.E.1. "Bucheron, London." Victoria 10.

**Time Recorders—** Hop 38.

Gledhill-Brook Time Recorders, Ltd., Victoria Street, S.W.1. Victoria 10.

**Turnbuckles—** Rubery Owen & Co., Darlaston, South Staffs.

**Tyres and Wheels—** The Palmer Tyre, Ltd., Shaftesbury. "Tyricord, Westcent." Gerrard 10.

**Undercarriages—** Thompson Bros. (Bilston), Ltd., Bilston, England. "Thompson Bros, Bilston." Bilston 10.

**Varnishes—** The British Emailite Co., Ltd., 30, Street, S.W.1. "Ridley, London." Victoria 10.

Clark, R. Ingham & Co., Waiter Bedford Street, Strand, W.C. "Westrand." Strand 10.

Harland, W., & Son, Merton, London. "Harland, Wimbledon 45." Wimbledon 45.

Naylor Bros., Ltd., Southall. "Naylor, Southall." Southall 10.

**Vices—** C. and J. Hampton, Ltd., Sheffield. "Hampton, Sheffield." Sheffield 10.

**Washers—** Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1472.

Herbert Terry & Sons, Ltd. "Springs, Redditch." Redditch 61.

**Watchmakers and Jewellers (Silver Models)—** Goldsmiths' & Silversmiths' Co., 1, Regent Street, W.1. Gerrard 0001.

**Welding and Cutting Plants—** Imperial Light, Ltd., 123, Victoria Street, S.W.1. "Edibrac, Phone, London." 3540 Victoria.

**Welding Repairs—** Barimar, Ltd., 10, Poland Street, W.1. "Barimar, Reg, London." Gerrard 10.

The New Welding Co., 26, Rosebery, London, E.C.1. "Windoneeda, London." Holbe 10.

Imperial Light, Ltd., 123, Victoria Street, S.W.1. "Edibrac, Phone, London." 3540 Victoria.

**Wind Shields—** Auster, Ltd., 133, Long Acre, W.C. "Auster, London." Regent 10.

London Label Co., Ltd., Hadley Beclton Road, E.16. "Nonflamoid flammable Celluloid." Lonlabel, London." East 1300.

Triplex Safety Glass Co., Ltd., 1, Street, Piccadilly, W.1. "Shatterly, London." Regent 1340.

**Wire Gauze—** N. Greening & Sons, Ltd., 16, Fins, London, E.C.2. "Seiscrow, Fins, London." London 10.

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1472.

**Wires and Cables (Aeroplanes)—** Bruntons, Musselburgh, Scotland. "Bruntons, Musselburgh." Musselburgh 10.

Cradock, Geo., & Co., Ltd., Wakefield. "Cradock, Wakefield." Wakefield 466.

**Wirework—** Terry Herbert & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

**Woodworking Machinery—** Robinson, Thomas, & Son, Ltd., Works, Rochdale. "Robinson, Rochdale." Rochdale 10.

Sagar, J., & Co., Ltd., Halifax. "Sagar, Halifax." Halifax 10.

Wadkin & Co., Leicester. "Wadkin, Leicester." Leicester 10.









**CONTRACTORS TO THE ADMIRALTY.**

"SUPERMARINE,"  
WOOLSTON 37.

ESTABLISHED 1912.

**The Supermarine**

**Aviation Works Ltd**

**Designers and constructors of Aircraft.**

WATER & SLIPWAYS:  
**WOOLSTON**  
T. PAINE, GENERAL MANAGER.



OFFICES & WORKS:  
**SOUTHAMPTON**  
ENGLAND.

**Requirements.**

SEVERAL FIRST-CLASS DRAUGHTSMEN.  
Good Salaries offered to competent and experienced men.  
No one at present engaged on Government work  
need apply.

**MATERIAL.** Offers required for the following:—

Finned Steel Sheets, various gauges

Aluminium, do. do. do.

wood,  $\frac{1}{16}$ ",  $\frac{3}{32}$ ",  $\frac{1}{8}$ ",  $\frac{3}{16}$ ",  $\frac{3}{8}$ ",  $\frac{1}{2}$ ",  $\frac{9}{16}$ "

Shackle Pins, 137 D.

AVRO Turnbuckles,

Types D. & F.



**THE GRAHAME-WHITE AVIATION CO., LTD.,**  
**AERONAUTICAL ENGINEERS.**

**NOTICE**

**To DeH.6. Contractors.**

We can supply *ex* STOCK  
BLANKINGS for all Metal Parts.

*Special developments of the following:—*

Parts Nos. 9485 } Three blankings per s  
" " 9488 }

Telephone:—Kingsbury 120 (5 lines).

Telegrams:—Volplane, Hyde, London.

**THE LONDON AERODROME, HENDON, N.W.9**

Proprietors of the London Aerodrome and the Grahame-White School of Flying.



# The "Guardian Angel" Parachutes



For Life-saving uses on the Training Grounds; and for special Naval and Military operations. Open automatically, and dropped from Aeroplanes, always carry their man within  $2\frac{1}{2}$  seconds. Open instantaneously, and bring their man safely to the ground from any height above 200 feet. All the Airman has to do is to jump overboard, everything else is done for him automatically. Pilots can in the last resort charge enemy Aeroplanes with every prospect of their own safety. Non-spinning Shock-Absorber Slings, taking all shocks off the Parachutist and Parachute. Aviator's Harness, to carry safely a wounded or insensible man. Instant release on landing. Standardised in every detail, air and waterproof, they can be carried continuously for six months. These Parachutes are under static and kinetic control in all the phases of their action. There is no possibility of the entanglement of their rigging in the fiercest air current. These Parachutes can be dropped with absolute safety from Aeroplanes flying at any speed. These Parachutes reduce free-fall to its minimum, thus preserving the Airman's nerves. Adapted for use with every type of Aircraft; Kite and Free Balloons, Airships and Aeroplanes. Special adaptations made for special purposes: they are adaptable to every kind of purpose. These Parachutes are sealed to prevent tampering: the seals are broken only in the act of usage.

**RELIABILITY—First.      RELIABILITY—Second.      RELIABILITY—ALL THE TIME.**

**E. R. CALTHROP'S AERIAL PATENTS, LTD.**

ELDON STREET HOUSE, ELDON STREET, LONDON, E.C.2.

Telephones (2 lines): London Wall 3266 and 3267.

Telegraphic and Cable Address: "Savemalivo-Ave-London."

Telephones: DALSTON 872.

LONDON WALL 9766.

HAMPSTEAD 4768.

## Thames Aviation Works

(BURTON'S, LTD.)

**TWO COMPLETE MILL PLANTS AND TWO YEARS' EXPERIENCE.**

**Erecting Shops and Saw Mills:**

(Addresses may be had on application.)

**Offices only: 141, CURTAIN ROAD, E.C.**

**CONSTRUCTORS OF COMPLETE AIRCRAFT**

**And all kinds of WOOD PARTS, WINGS, AILERONS,**

**— STRUTS, LEVERS, RUDDERS, NACELLES, &c. —**

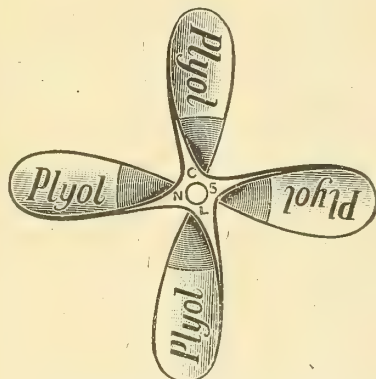
**Specialities—BIG STUFF and BEST WORK.**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



**"PLYOL"**

THE  
BEST CEMENT  
FOR  
THREE-PLY,  
Veneering, etc.



Registered Trade Mark.

## ALDGATE CASEIN WORKS.

**NIEUWHOF, SURIE & Co., Ltd.**

HEAD OFFICE:

**5, Lloyds Avenue, London, E.C. 3.**


Works:

**ALDGATE AVENUE, ALDGATE, E.C.**

Also Casein especially adapted for  
Waterproof Paints, Varnish, etc.

Telephones:  
AVENUE 34, 35,

Telegrams:  
'SURICODON, FEN LONDON.'



*Non-Flammable  
Celluloid*

Phone Central 1306 & 1307

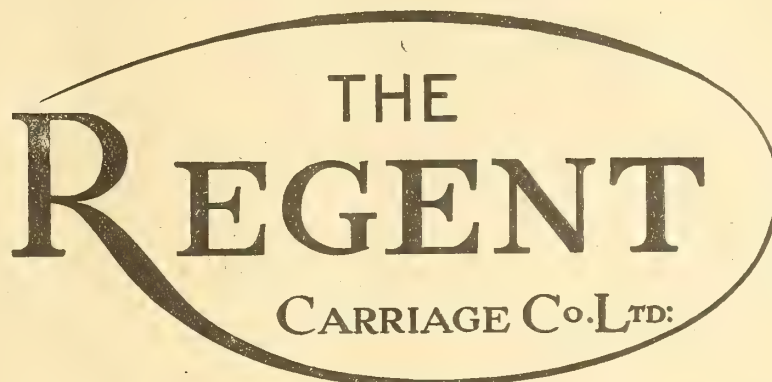
Telegrams 'GREENBERG' LONDON

**GREENHILL & SONS**  
**8 WATER-LANE LUDGATE HILL**  
**LONDON. E.C. 4**



Contractors to H.M. Government.

Telegrams:  
CARBODIS  
LONDON.



Telephones:  
PUTNEY  
2240-1.

## AERONAUTICAL ENGINEERS

Designers, Manufacturers and Contractors,

126-132 NEW KINGS ROAD, FULHAM, LONDON, S.W.6.

## NIEUPOORT

AND

### GENERAL AIRCRAFT COMPANY, L<sup>TD</sup>.

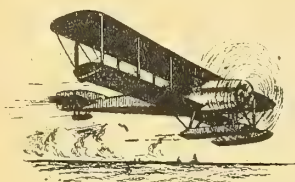
CONTRACTORS TO H.M. GOVERNMENT

OFFICE AND WORKS—

LANGTON ROAD,  
CRICKLEWOOD, LONDON, N.W.2

TELEPHONE (3 LINES)—  
WILLESDEN 2455

TELEGRAMS—  
NIEUSCOUT, CRICKLE, LONDON



**JOSEPH EVANS & Co., LTD.**  
LIVERPOOL STREET MILLS,  
BIRMINGHAM,



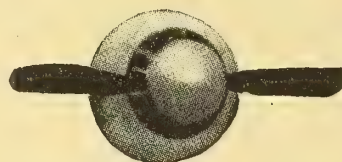
Manufacturers of  
**COMPONENT PARTS USED ON**

**AERO ENGINES & AIRSHIPS.**  
**SHORT and FAIREY SEAPLANES.**

SPAD and H. FARMAN.

**D.H. MACHINES.**

SOPWITHS.



FLYING BOATS.

**AIRSCREWS.**

TELEPHONE : CENTRAL 733.

TELEGRAMS: "ADEPT, BIRMINGHAM."

**Contractors to the Admiralty and Air Board.**

**THE**  
**CENTRAL AIRCRAFT COMPANY**

**DESIGNERS AND CONSTRUCTORS**  
**OF AIRCRAFT.**

**Office and Works :**

**KILBURN, N.W.6.**

Telegrams: Aviduction, Phone, London.

Telephone: Hampstead 4403, 4404.



## THE PATENTS INDEX.

The subjoined list of recent inventions has been specially compiled by THE AEROPLANE from the current Official Patents Records.

## PATENT APPLICATIONS.

- Anderson, R. Y. Wheels for aeroplanes. No. 185. Jan. 3rd.  
 Ayling, G. Aeronautical machines. No. 313. Jan. 5th.  
 Baker, C. T. G. Machine-gun synchronising-means for firing through propellers, etc. No. 107. Jan. 2nd.  
 Beer, F. de. Aeroplane level system. No. 299. Jan. 5th.  
 Blackburn Aeroplane and Motor Co. Hydro-aeroplanes. No. 123. Jan. 2nd.  
 Boulton and Paul. Gun-mountings for aircraft. No. 188. Jan. 3rd.  
 Boulton and Paul. Gun-mountings for aircraft. No. 190. Jan. 3rd.  
 Bridger, H. K. Devices for fouling vessels, aircraft, etc. No. 137. Jan. 2nd.  
 Brown, W. Indicator for showing angular movements of aeroplanes, etc. No. 176. Jan. 3rd.  
 Buckham, Sir G. T. Instrument for finding position and following movements of aircraft. No. 266. Jan. 4th.  
 Carter, H. M. Indicating-means for use on aircraft. No. 307. Jan. 5th.  
 Chamier, F. W. Aerial machines. No. 61. Jan. 2nd.  
 Jennings, F. A. Turnbuckle or straining device for wires, cords, etc. No. 263. Jan. 4th.  
 Kinneir, J. Balfour. Anti-aircraft defence devices. No. 101. Jan. 2nd.  
 Law, R. Shaping ends of aeroplane struts, etc. No. 78. Jan. 2nd.  
 Levi, H. Level for aeroplanes, etc. No. 158. Jan. 3rd.  
 McDougall, W. A. Automatic aeroplane side-slip detector. No. 160. Jan. 3rd.  
 Maiche, C. Aerial machines. No. 122. Jan. 2nd.  
 Milmore, B. E. Aeroplanes. No. 236. Jan. 4th.  
 Munroe, J. M. Flying-boats and aircraft. No. 269. Jan. 4th.  
 Scroston, W. Level-indicator for aircraft. No. 215. Jan. 4th.  
 Sopwith Aviation Co. Turnbuckles for stays and bracings. No. 194. Jan. 3rd.  
 Taylor, W. Levels for aircraft. No. 19. Jan. 2nd.  
 Wade, G. H. Manœuvring apparatus for aeroplanes. No. 140. Jan. 2nd.

COMPLETE SPECIFICATIONS ACCEPTED, PRINTS OF WHICH CAN BE OBTAINED ON AND AFTER JANUARY 24TH, 1918.

- 112,030. Sept. 29th, 1916. Reynolds, A. J. Arrangement of guns on aircraft.  
 112,043. Dec. 20th, 1916. Delaney, L. T. Radiator for use on aeroplanes or other vehicles and for use in connection with cooling internal combustion engines.  
 112,140. Nov. 7th, 1916. Gerrebos, A. C., and Gossens, H. Aeroplane control mechanism.  
 112,163. Dec. 27th, 1916. Taylor, S. Method of and apparatus for compressing air or other gaseous matter for blast engineering and aviation purposes.

## ABRIDGEMENTS OF RECENTLY PUBLISHED SPECIFICATIONS.

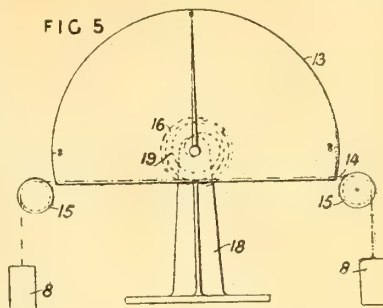
- 110,565. Aeronautical apparatus. STARLING, S. G., 61, Windsor Road, Forest Gate, Essex, and HUGHES, A. J., and HUGHES and SON, H., 59, Fenchurch Street, London.

Apparatus for use on aircraft for measuring the tilt or radial acceleration during turning movements and for compensating for the effects of such tilt, etc., on a magnetic compass carried by the aircraft is based upon the fact that the apparent weight of a body suspended on the aircraft is increased during such movements. Figs. 1 and 2 show a weight 8 carried by a bar 1 suspended by a spring 3 from a frame 6, the bar 1 working in guides 2 and being connected by a link 4 to a pivoted pointer 5 capable of moving over a dial 7. The weight 8 becomes subjected to centrifugal force when the aircraft moves in a curved path, and, owing to the accompanying tilt of the aircraft and of the apparatus shown, the resultant of this force and of the force due to gravity acts in the axis of the spring. The spring consequently

becomes extended, and the pointer moves over the dial to indicate the tilt or radial acceleration. In a modification, the weight is suspended from an horizontal arm which is pivoted at one end to a supporting bracket, and is maintained in position

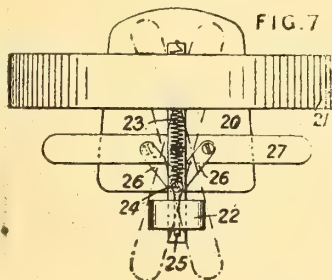
by a spiral spring. The arm carries a pointer moving over a dial. In a further modification, Fig. 5, two weights 8, one on each side of the median line of the aircraft, are supported by a cord 14 which passes over pulleys 15 and is secured to a pulley 16. The spindle of the pulley 16 is connected to a supporting bracket 18 by a

FIG 5



spiral spring 19 and carries a pointer which moves over a dial 13. The difference between the radial accelerations to which the weights are subjected, due to the difference in radius of the paths of the weights when the aircraft turns, causes the pointer to move and to travel to the right or left according to the direction of tilt. Fig. 7 shows the movable

FIG. 7



system of a compass which comprises a card 21 secured to a float 20 and embodies the invention. Magnetic needles 27 are pivotally mounted in pairs on opposite sides of the float, and affect or assist the orientation of the card. A weight 22 is provided on each side of the float and is carried by a spindle 24 which is capable of moving in guides 25, and is suspended by a spring 23.

Each spindle 24 is connected by links 26 to the corresponding pair of needles, and during turning movements the weights turn the needles about their pivots, as indicated in broken lines, to reduce the magnetic moment of the movable system and reduce deflection of the card. In a modified construction of the movable system of a compass, pivoted needles are provided one on each side of the float, the needles being weighted at opposite ends and being held in normal position by spiral springs.

- 110,812. Aeronautics. LOW, A. M., R.F.C. Experimental Works, Feltham, Middlesex, and DICKINSON, J., 69, Heathfield Road and BRITISH AIRCRAFT, LTD., 32, Charing-Cross, Whitehall, both in London.

AEROSTATS.—In airships more particularly of the rigid type, having the framework constructed to permit of expansion and contraction of the gas, the transverse frame members are composed of hubs *g*, Fig. 2, connected by radial members *f* sliding through blocks *i* on the hubs, to peripheral elements *h* also in sliding or telescopic relation. Springs *j* may be arranged on the radial members. In the modification shown in Fig. 2a, the radial members *f* are connected to the members *h* by bell-cranks *m*. In another form, the radial members are telescopic. The transverse frames may comprise rigid inner parts, *f*, *g*, *h*<sup>1</sup>, Fig. 4, connected by extensible members *o* to the peripheral elements *h* or to the longitudinals *a*.

FIG. 2a

FIG. 2

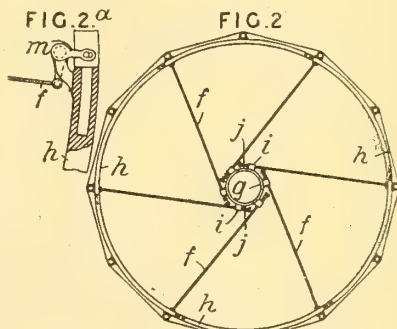
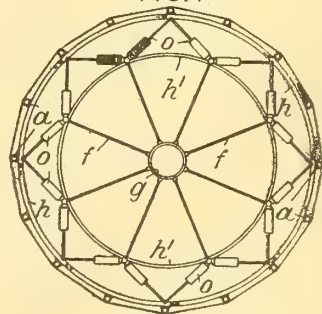
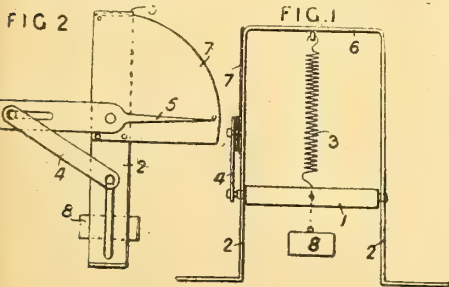


FIG. 4

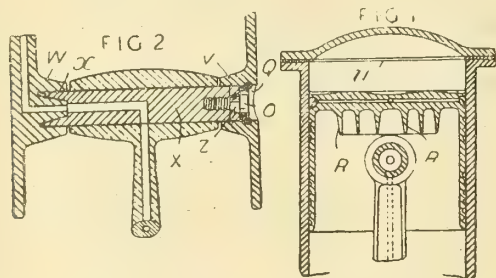


- 110,844. Internal-combustion engines. PULLIN, C. G., 18, Ranelagh Avenue, Barnes, London.

CYLINDERS; CONNECTING-RODS; PISTONS, COOLING.—Both cylinders and piston are made of aluminium and the object of the invention is to enable a gudgeon of steel or other hard-wearing material to be used without it becoming slack owing to expansion

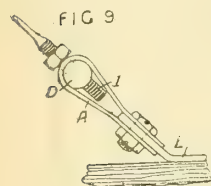


of the piston when hot. The cylinder cover is separated from the cylinder by a non-conducting packing *u* and the inner surface of the piston end is provided with cooling-ribs *R*. The gudgeon *X* has a split tubular conical end which fits into a correspondingly recessed boss *W* on the piston. A pin *X* prevents rotation of the gudgeon, and the crank-pin can be lubricated through the pin



by the means shown. The other end of the pin is tapped to receive a screw *O* having a conical neck *Z* which fits a similar recess in the split end of the pin. The pin can by these means be tightened in the piston while cold, so that when the piston is hot the pin does not become unduly slack. A spring ring *Q* fits into a recess formed partly in the head of the pin *O* and partly in the boss *V* to lock the pin in position. Both ends of the pin may be secured by conical-headed screws as shown to the right in Fig. 2.

**110,795. Aircraft.** SOPWITH AVIATION CO. and SOPWITH, T., Kingston-on-Thames.



The ends of wires, cables, or stays upon aircraft, especially aeroplanes, are secured to a swivelling or trunnion pin *D* embraced by a sheet-metal carrier *A* fastened to the machine by a plate *L*. The carrier *A* is stamped or cut with a longitudinal slot in which a projection or shoulder on the trunnion engages. The pin is formed diametrically with a screwed hole in which the screwed end *I* of the cable is adjusted.

## HOME-GROWN TIMBER REGULATIONS.

In pursuance of the powers conferred upon them by Regulations 2F and 2J of the Defence of the Realm Regulations as respects timber, the Board of Trade hereby order as follows:—

1. As and from the first day of December, 1917, no person shall sell or offer for sale, or purchase or offer to purchase any timber grown in the United Kingdom at prices exceeding the following:

(a) For timber standing or felled in the wood the prices set forth in Schedule A hereto annexed.

(b) For timber in the log delivered free on rail at loading station the prices set forth in Schedule B annexed.

(c) For converted Hardwood timber delivered free on rail at loading station the prices set forth in Schedule C hereto annexed.

(d) For converted Softwood timber delivered free on rail at loading station the prices set forth in Schedule D hereto annexed.

2. The Home-grown Timber Prices (Great Britain) Order, 1917 (T24051), is hereby cancelled without prejudice to any act or thing done or suffered, or any penalty incurred or proceeding or prosecution taken or begun thereunder.

Signed on behalf of the Board of Trade, this 4th day of December, 1917.

H. LLEWELLYN SMITH.

### Schedule A.

Schedule of Maximum Prices for Standing Timber.

Prices are per cubic foot,  $\frac{1}{4}$  girth Hoppus Measure, tape over bark, with the customary allowance for bark.

	Per cubic foot.
	s. d.
Ash.—Selected for Aeroplane purposes.....Not exceeding	5 0
Ash.—For other purposes .....	3 0
Ash.—Inferior descriptions .....	1 6
Poplar, Alder, and Lime .....	1 3

For timber felled and trimmed lying in the wood the above prices may be increased up to 10 per cent.

### SCHEDULE B.

Schedule of Maximum Prices for Timber in the Log, delivered free on rail at loading station.

Prices are per cubic foot, Hoppus measure, tape over bark, less allowance for bark as per scale given, and subject to  $2\frac{1}{2}$  per cent. discount for cash payment within one month from date of dispatch.

	Allowance for bark per cent. of volume.	Price per cubic foot not exceeding s. d.
Scots Pine and Douglas Fir .....	10	2 1
Selected lengths and diameters .....	10	2 4
Spruce and other Coniferous Timber (except the above) .....	10	2 0
Selected lengths and diameters .....	10	2 3
Ash, aeroplane, selected butts, 12 ft. and up, taken to the first stop or branch .....	$7\frac{1}{2}$	7 6
Other Logs .....	$7\frac{1}{2}$	5 0
Inferior Timber .....	$7\frac{1}{2}$	2 6

Logs of exceptional dimensions required for special purposes may be negotiated at proportionate prices, but in such instances sellers must submit particulars to the Controller of Timber Supplies and obtain his approval thereto.

Where Timber (other than pitwood) is sold by weight, the price shall not exceed the equivalent price per cubic foot based on the above maximum prices.

### SCHEDULE C.

Schedule of Maximum Prices for Converted Hardwoods, delivered free on rail at loading station.

Prices are per cubic foot, and subject to  $2\frac{1}{2}$  per cent. discount for cash payment within one month from date of dispatch.

	Per cubic ft. s. d.
Ash.—For aeroplane purposes, logs cut through and through .....	8 6
Selected lengths and thicknesses of plank.....	10 6
Ash.—For other purposes, logs cut through and through .....	3 6
Selected lengths and thicknesses of plank.....	7 0
Poplar, Alder, and Lime.—Logs cut through and through .....	3 6
Selected lengths and thicknesses of plank.....	4 6

Specifications which do not come within the above Schedule may be negotiated at proportionate prices, but in such instances sellers must submit particulars to the Controller of Timber Supplies and obtain his approval thereto.

Timber in the round may also be sold and converted for buyers' account, the cost of sawing being charged separately at current local rates, provided that the aggregate price for log and sawing shall not exceed the prices set out in this schedule, based on the measurement of the converted timber obtained.

Town sawmills and town retailers are permitted to increase the above scheduled prices for converted hardwoods up to 20 per cent., such increased prices to cover cost of conveyance of log to town mills or town yards, and delivery of converted material from mills or yards free on rail or within the usual cartage radius.

## FAIREY TALES.

The Fairey Aviation Co., Ltd., are taking advantage of the New Year to issue the first number of a works magazine, which seems rapidly becoming the alpha and omega of every aeroplane works. A Christmas and New Year issue always acts as a good send-off for any paper, and the producers of "Fairey Tales," as the new magazine is called, have every reason to be proud of their first effort. The Fairey magazine is evidently intended to be educative as well as amusing, and a good effort in this direction is made by one A. M. N., who has written some verses intended to educate the aircraft worker on the importance of good workmanship. Space does not permit the reproduction of the whole poem, but the last verse gives the tenor of the whole thing and reads as follows:—

"Think of the downward hurtling fall, and the unavailing wrench,

As the pilot spins to his death, betrayed by a careless touch at the bench.

He must depend on your faithful care in that brief, tense hour of strife

Concealed mistakes are wilful crimes, and may cost a brave man's life."

The various features of "Fairey Tales" are too numerous to mention in detail, but considerable literary as well as artistic talent are incorporated in its production. One's chief quarrel with the magazine is its price. Even in these days of the wage earner's Income Tax, sixpence is too much to charge for an 18-page paper, however well produced, and it would very well pay any firm which runs a works magazine to adopt the nominal price of a penny, as any direct financial loss which might occur in its production would be very well worth while by reason of its propagandist value, both inside and outside the factory. At the same time one strongly recommends everybody interested to send seven stamps to the editors of "Fairey Tales," c/o. The Fairey Aviation Co., Ltd., Hayes, Middlesex.

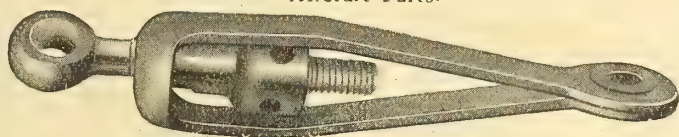




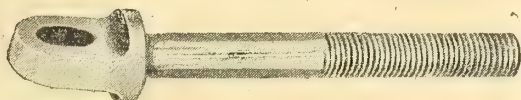
A Portion of the Main Shop on Engine and Aircraft Parts.

## ASCOL SERVICE.

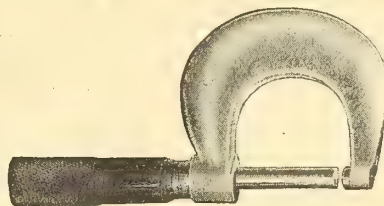
AIRCRAFT Manufacturers interested in speeding up and increasing their output are invited to visit our Showrooms at *Ascol House, Long Acre, W.C.2*, where they will find displayed, in orderly sequence, all the requisite parts and equipment for Aircraft Construction, covering most items from a Split Pin to a Complete Unit. Here actual fittings can be examined and supplies taken away, without delay.



Sole Selling Agents for "AVRO" Patent Turnbuckles, as illustrated above.



D.H. 6. Special Fly-bolts for Main Planes. Drawing No. 9064. Now on the machines in our own shops. Passed by the A.I.D.



The "ASCOL" Micrometer.

For full details see "Aircraft Supplies," our Fortnightly House Journal.

Copies of "Aircraft Supplies," our Fortnightly House Journal, containing a complete List of Aircraft Parts in Stock at the time of going to press, Current Prices, Details of New Items, Enquiry Bureau, Charts and

Tables of various parts, and innumerable particulars of interest to Aircraft Manufacturers, will be sent free to the Aircraft Industry on receipt of application on business stationery.

# THE AIRCRAFT SUPPLIES COMPANY LTD

CONTRACTORS TO THE AIR BOARD.

Head Offices, Showrooms, and Stores:

ASCOL HOUSE, 125, LONG ACRE, LONDON, W.C. 2.

Representatives in Birmingham, Manchester, Leeds, Belfast, Northern Counties and Scotland, South Coast, and the London District.

Managing Director:	Works:	Telephone:	Telegrams:
G. H. MANSFIELD.	Little James St.	Gerrard 276.	"Upcast, Rand,"
		(Private Branch Exchange.)	London.





**NON-POISONOUS  
DOPE**

**TITANINE**



THE  
**BRITISH AEROPLANE  
VARNISH CO., LTD.**  
166, PICCADILLY, LONDON, W.1

Telephone : . . . . . GERRARD 2312.  
Telegrams : TETRAFREE, PGGY, LONDON.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# THE AIRCRAFT TRADER

## MARKET TOPICS.

(Prices are for quantities on usual terms.)

Jan. 10th, 1918.

**COPPER.**—There does not now appear to be any danger whatever of a shortage of Copper being experienced. Labour troubles appear to have been entirely overcome, and the output is steadily increasing.

The general opinion is that the Official price in the U.S.A. will be advanced on Jan. 21st, whatever happens. Several producers are requesting the Authorities to fix the price for a period of five months, instead of four months.

The U.S. Government are placing large contracts at the present price of 23½ cents. The producers are, however, insisting upon all contracts for future deliveries being subject to any revision of price taking place after Jan. 21st.

The position here remains unchanged; supplies are still very favourable.

### Comparative Prices.

To-day (Standard) .....	£110 0 0 per ton.
Lowest price, 1917 .....	£84 0 0 per ton.
Price in 1916 .....	£87 7 0 per ton.

**TIN.**—The recent regulations governing transactions in Tin have created a very unsettled state of affairs. The general opinion is that the Authorities were quite justified in taking action. In fact, the influence of the London Exchange throughout the world will be affected seriously, owing to the necessity having arisen for the Government to take action in order to put a stop to speculative dealings in a metal which is so urgently required for munition purposes.

The New York Exchange is much disturbed. Early in December one of their contributors stated:—

"At the record high prices of the last few months, the disclosures of a stock in London of 4,188 tons Straits Tin, and 703 tons other kinds, confirms all we have said in the past that there must be plenty of Tin abroad. This is more than twice the normal stocks, and yet we suffer for Tin and London interests are unable to offer any to American firms, even subject to a permit. Why? Because this large stock has been previously sold to our consumers and dealers, and has accumulated in London, and is being held for their account, because of the few permits to ship being granted by the London Tin and Rubber Committee. How long must this intolerable situation continue?"

The recent reduction in price of over £40 per ton, had its effect upon the Eastern markets, but, as was expected, holders there are very reticent, and are not willing to sell.

The future is very uncertain, and it is foolish to attempt to forecast what will happen, although the market appears to be gaining strength.

### Comparative Prices.

Jan. 7th .....	£281 0 0 per ton.
Jan. 3rd .....	272 0 0 per ton.
Dec. 28th .....	293 0 0 per ton.
Dec. 21st .....	308 0 0 per ton.
Two years ago .....	173 5 0 per ton.

**LEAD.**—The price of Lead has now been officially quoted at £29 10s. to £28 10s. net. Supplies are getting easier, and the authorities are allowing some Lead to be used for shot for sporting cartridges.

**STEEL.**—The steady progress which was being made in Steel production has received a very serious setback. The Sheffield Mills had a week's holiday and another week was lost owing to trouble between the Ministry of Munitions, the men and the masters.

Apparently the masters sanctioned certain advances to the men and at the last minute, after the pay envelopes had been prepared, the Minister of Munitions stepped in and instructed the masters not to pay it, the result being that the men went on strike.

If the Ministry had only been a little more reasonable, not a day's output need have been lost, but even when the men went on strike, to all appearances the Ministry were not in a desperate hurry to effect a settlement.

Supplies of High Speed Steel and Cast Steel are a little easier. There must, however, be a considerable improvement, if all the Aircraft Factories, in addition to all other consumers, are to be kept well supplied.

**TIMBER.**—It is very gratifying to see the efforts which are being made by the Air Board to put an end to the shortage of wood for aeroplane work. Very fair shipments have been received recently, but the danger-mark has not yet been passed.

By the way, cannot some intelligent official instruct all A.I.D. inspectors what to do with "—," and if the Air Board for some unknown reason are unwilling to furnish constructors with a list of the approved Silver Spruce substitutes, has the same unknown reason caused them to refrain from notifying the A.I.D. that the "blank" wood referred to above would be used?

The reason these questions are asked is because one hears of firms, who have had consignments of such wood delivered to them, being told by the A.I.D. inspectors that they have no authority to pass it. Correspondence commences between the Constructor, D.P.O., A.I.D. Headquarters, and the Air Board, and, when the official notification leaks through, one presumes the A.I.D. inspector will refer to the A. E. Specification V1 for Silver Spruce Substitutes, only to find that, although the timber when inspected must be divided into two classes—i.e., Class A1 and Class A2, no reason is given for this classification, nor any stipulation that the wood must only be used on certain parts according to class. On the face of it there appears to be a great deal of muddle and delay taking place.

The position of 3-Ply is still very serious indeed, and the attention of the Authorities is directed to the remarks under this heading in THE AEROPLANE of Dec. 19th advising—

- (1) Conservation of stocks by controlling the use of 3-Ply.
- (2) Economical use of 3-Ply. Instructing works how to cut up boards. Using up of scrap.
- (3) And thirdly, it is now suggested that the standard of inspection be reduced. Thousands of boards must be rejected by the A.I.D. which could be used for various internal parts of the machines.

Recent shipments of Mahogany have only been fair; there does not, however, appear to be any acute shortage at present.

**FABRIC.**—Why is the Air Board only allocating a few thousand yards to some firms who have applied for anything from 80,000 to 150,000 yards? Is it to be concluded that the same Department which, according to information received, is responsible for the Air Board price of 36-inch Fabric being 2s. 8d. to the Contractor, while the weaver only gets 2s. 5½d., is now holding back allocations until the price for 1918 has been fixed? In other words, is it hoarding up supplies against a possible advance in price? There may, of course, be other reasons for this step, but it is doubtful, and general suspicion appears to have been created.

The question of Flax is very serious indeed, and the price is still soaring. There are fears that the Russian Flax crop will become German property, and, in any case, there is little hope of it coming here. This in itself will affect the price.

**OXYGEN.**—For some time now there has been a most acute shortage of oxygen; in fact, on several occasions a few aircraft factories have been compelled to stop their welders owing to the lack of gas. This state of affairs can only be attributed to the lack of foresight. If the Air Board knew nine months ago how many aeroplanes it was intended to build during the six months ending December 31st, 1917, a simple multiplication sum would have given them the total cubic footage of oxygen which would be required. An allowance would, of course, have had to be made for strikes and other stoppages. The output of the plants producing oxygen could easily have been ascertained.

The position has been very serious for two or three months, and unless drastic and vigorous action is taken the position will be serious this spring.

## CURRENT MARKET PRICES.

Jan. 10th, 1918.

The prices given below are the prices ruling on the above date.

**TERMS.**—Usual for the various materials mentioned.

Prices of old metals are as quoted by scrap dealers.

Prices must not be taken as specific quotations for definite quantities delivered to any part of the country.

### ALUMINIUM.\*

Ingot .....	£225 per ton.
Remelted .....	£210 per ton.



**BRASS.**

Sheets	.....15½d. per lb.
Strip	.....14½d. per lb.
Wire	.....14½d. per lb.
Tubes	.....16d. per lb.
Castings	.....16d. per lb.
Turning Rod	.....14d. per lb.
Brazed Tubes	.....19½d. per lb.

**COPPER.**

Ingot, Standard, Cash	.....£110 per ton.*
Ingot, Standard, 3 mos.	.....£110 per ton.*
Best Selected (nett)	.....£125 to £121 per ton.
Sheets	.....£147 per ton.
Wire	.....15½d. per lb.
Tubes, S.D.	.....18½d. per lb.
Tubes, Brazed	.....18½d. per lb.
Rivets	.....1s. 10½d. per lb., basis.
Tacks	.....1s. 10d. per lb.

**FABRIC.\***

Linen, R.A.F., 17C, Spec., 36 in. wide, 2s. 8d. p. yd.	
Linen, R.A.F., 17C, Spec., 38 in. wide, 2s. 9½d. p. yd.	
Spaced, R.A.F., 17C, Spec., 37½ in. wide, 1s. 9d. p. yd.	

**GUN METAL.**

Castings	.....1s. 8d. per lb.
----------	----------------------

**LEAD.**

Virgin Pig	.....£29 per ton. c.i.f.
Virgin Pig	.....£30 per ton, ex stores.
Sheets	.....£39 10s. per ton, D/d.
Pipes	.....£40 per ton.
Dry White	.....£46 10s. per ton, less 5 per cent.
White in Oil	.....£53 per ton.
(lots over 5 cwt. less 5 per cent.)	
White in Oil	.....£55 per ton.
(lots under 5 cwt. less 5 per cent.)	
Red	.....£42 per ton, less 2½ per cent.

**NICKEL.\***

Nickel	.....£200 per ton.
--------	--------------------

**PHOSPHOR BRONZE.**

Ingots, 5 cwt. and under	.....£156 to £157 per ton
(Subject to Copper and Tin Fluctuations.)	
Castings	.....1s. 7½d. to 1s. 9½d. per lb

**PHOSPHOR COPPER.**

Tin lots	.....£200 to £205 per ton.
----------	----------------------------

**SILVER.**

Silver	.....45½d. per oz.
--------	--------------------

**SOLDER.**

Plumber's	.....120s.
Tinman's	.....165s.

**STEEL.\***

High Speed, 14 p. cent., Tungsten, 2s. 10d. per lb., basis.	
High Speed, 18 p. cent., Tungsten, 3s. 10d. per lb., basis.	

**ALLOY STEELS TO AIR BOARD SPECIFICATIONS.†****Round and Square:—**

Specification No. S2	.....£86
Specification No. S2 (bright-drawn)	.....£115
Specification No. S8	.....£86
Specification No. S10	.....£70
Specification No. S12	.....£75
Specification No. S14	.....£43
Specification No. S15	.....£70
Specification No. S16	.....£70
Specification No. S17	.....£75
Specification No. 18 (oil-hardened)	.....£86
Specification No. K1	.....£75
Specification No. K2	.....£75
Specification No. K3	.....£86

The above prices are for ¼ in. to 5/16 in. only, other sizes are proportionate.

**HEXAGONS.**

	.....455 and .525	......601 and .710.
Specification S2	.....£79	.....£77
Specification S8	.....£79	.....£77
Specification S2 (bright-drawn)	.....£112	.....£112
Specification S8 (bright-drawn)	.....£112	.....£112

**SPELTER.**

English f.o.b., Birmingham	.....£57
----------------------------	----------

**TIN.**

Tin	.....£281
-----	-----------

**TINPLATES.\***

Tinplate	.....30s., basis, f.o.t.
----------	--------------------------

**TIMBER.**

Official. Merchants.†

Silver Spruce, 10s. 4d.	.....18s. c.f.
English Ash	.....16s., c.f.
Poplar	.....15s. to 16s.
Cypress	.....10s. 4d. to 15s. 6d. plus Freight.
Mahogany, 1s. 10d. to 2s.—2s. 2d. to 2s. 6d., s.f.	
Walnut, 2s. to 2s. 3d.—2s. 3d. to 2s. 6d. s.f.	

**ZINC.**

Zinc Sheets (American)	.....£100, f.o.b., New York.
------------------------	------------------------------

**SCRAP MATERIALS (LONDON PRICES).****ALUMINIUM.**

Description.	Price per ton on sale to refiner, delivered at refinery.
Sheet cuttings and rods containing a minimum of 96 per cent. Al.	105 0 0*
Old rolled, etc., containing a minimum of 96 per cent. Al.	120 0 0*
Spinnings, punchings, and thin small scrap; also painted and varnished scrap that needs melting, containing a minimum of 96 per cent. Al.	105 0 0*
Lump scrap from aero castings and material of equivalent value, containing 87 to 95 per cent. Al.	100 0 0*
Turnings and Swarf, generally containing 87 to 95 per cent. Al.	87 10 0*
Scrap, generally containing 80 to 86 per cent. Al.	80 0 0*
Swarf and inferior Swarf, generally containing 80—86 per cent. Al.	70 0 0*
All Scrap, containing below 80 per cent. Al., not to exceed	65 0 0*
All Swarf, containing below 80 per cent. Al., not to exceed	60 0 0*
Heavy Steel Melting Scrap	5 5 0
Steel Planings, Turnings and Borings	3 5 0
Do. Do. Do.	
mixed with Wrought Iron or other material	2 10 0
All other class of Steel Scrap whether or not mixed with W.I. or other material	4 15 0
Brass, Heavy Selected	£88
Copper, Clean	100
Copper, Brazery	80
Gun-metal, Scrap	118
Lead, no Draft	26
Zinc, Old	40

\*Official Prices.

†Includes Parcel Inspection.

‡Prices include Delivery in the U.K.

**THE SUPPLY OF OXYGEN.**

The Admiralty desire to draw attention to an Order issued under the Defence of the Realm Regulations, and published in the "London Gazette" of Dec. 21st, regulating the sale and supply of oxygen in the United Kingdom.

Until further notice oxygen may only be sold or supplied in accordance with such directions as may be given by the Director of Material and Priority, Admiralty, who is also authorised to call for returns from persons and companies manufacturing or supplying oxygen, whether for sale or for their own use.

A notice has recently been issued by the Admiralty, dated December, 1917, governing the sale and purchase of oxygen.

**OXYGEN. December, 1917.**

The sale and supply of oxygen is (under Admiralty Order, dated Dec. 17th, 1917) henceforth to be regulated by the Director of Materials and Priority, Admiralty, Great George Street, London, S.W.1, under the advice of a joint committee appointed by the Admiralty and the Ministry of Munitions, to be known as the Oxy-Acetylene Committee.

All persons requiring to purchase oxygen must on or before Dec. 31st render to the above Director of Materials and Priority on the accompanying form a duplicate of their requirements for the first quarter (Jan. 1st to March 31st) of 1918.

They must also at least one month before the commencement of each succeeding quarter render to him a like return of their requirements for that quarter.

The necessary forms will be obtainable from the Director of Materials and Priority at the above address.

The Lords Commissioners of the Admiralty in exercise of the powers conferred upon them by the Defence of the Realm Regulations and all other powers thereunto enabling them, and with the concurrence of the Army Council and the Minister of Munitions, hereby order that from and after the date of this Order and until further notice the sale and supply of oxygen in the United Kingdom shall be regulated in accordance with such directions as may from time to time be given by the Director of Materials and Priority, Admiralty, and hereby order and require as follows:—

(1) No person or company manufacturing or supplying oxygen shall sell or supply the same otherwise than to such persons or companies and in such quantities as the said Director of Materials and Priority shall from time to time direct.

(2) All persons and companies manufacturing or supplying oxygen for sale or for their own use and all persons and companies requiring to purchase oxygen shall render such full and accurate returns as the said Director of Materials and Priority shall from time to time direct.



# Firth's Aircraft Steels.

|| Mark "A" Non-Magnetic  
|| Bullet-proof Plates  
|| For Armouring Aircraft.

Thos. Firth & Sons Ltd.,  
Sheffield.

# VICKERS LIMITED.

Contractors to the  
WAR OFFICE AND ADMIRALTY.

Aviation Department, Imperial Court,  
Basil Street, Knightsbridge, S.W.3.

Telephone No.—  
KENSINGTON 6810 (2 lines).



Telegraphic Address—  
VICKERFYTA, KNIGHTS, LONDON.





# ARMSTRONG, WHITWORTH

## AIRCRAFT WORKS,

### NEWCASTLE ~ UPON ~ TYNE.



TELEPHONE :- 500 GOSFORTH.

TELEGRAMS :- ARMSTRONG AVIATION,  
NEWCASTLE ~ ON ~ TYNE.

# GWYNNE

## LIMITED

CONTRACTORS TO H.M. ADMIRALTY AND WAR OFFICE.

SOLE LICENSEES AND MANUFACTURERS IN THE BRITISH EMPIRE  
OF THE

"CLERGET" PATENT AERO ENGINES.



WORKS & OFFICES: { CRISP ROAD, HAMMERSMITH, W.6. } LONDON.  
                                  { CHURCH WHARF, CHISWICK, W.4. }

TELEPHONES: 1910 HAMMERSMITH (3 lines).  
                  1780 CHISWICK (3 lines).

TELEGRAMS: "GWYNNE, LONDON."



# AIRCRAFT FINANCE

## CURRENT TOPICS.

### NEW COMPANY LEGISLATION.

By order of the Board of Trade a new form is prescribed in which the particulars required by Section 2 of the Companies (Particulars as to Directors) Act, 1917, shall be lodged with the Registrar of Limited Companies. The Act is entitled "Statutory Rules and Orders, 1917 (No. 854)."

This new Act, which received the Royal Assent on August 2nd, 1917, governs every company (private as well as public) and extends to every Director of a company or persons occupying the position of Directors and any persons in accordance with whose directions or instructions the Directors of a company are accustomed to act.

The schedule in the Act sets out the particulars required in the following form:—

Particulars of the Directors of the.....Company, Limited, on the.....day of.....19.....

The present Christian Name or Names and Surname.	Any former Christian Name or Names or Surname.	Nationality.	Nationality of Origin (if other than the present Nationality).	Usual Residence.	Occupations.

This form requires to be signed in statutory form. The attention of Company officials is drawn to the necessity of making every "Return" which is made up to any date subsequent to August 2nd last in the prescribed form.

Some further explanation of the information to be furnished may be found useful: The expression "Christian name" is declared by Section 22 of the Business Names Act (which in its application is made part of this Act) to include any "forename" irrespective of religious belief or creed.

In the case of a peer or titled personage, usually known by a title differing from his birth name, the title by which he is known must be substituted for his surname.

A naturalised British subject must declare the fact and state his "nationality of origin." The usual residence must state the address where the Director usually resides. The business address is no longer permissible. Under the column headed "Occupations," if a Director carries on a separate business, either alone or in association, or is a Director of other Companies, or is engaged in any professional duties, all such other "occupations" must be disclosed.

The necessity of carefully following out this enactment will be appreciated by the fact that the penalty for default in complying is five pounds per day—the Company and each Director, Manager, and official being alike liable.

### AN INTERESTING BALANCE-SHEET.

An American contemporary, "The Aerial Age Weekly," publishes in its issue of Dec. 3rd last a full statement of the affairs of "The Curtiss Aeroplane and Motor Corporation" and subsidiaries for the nine months ending Sept. 30th, 1917.

Apart from the general interest which the figures undoubtedly possess for the British Aeroplane Industry, the manner in which the figures and detailed information are set out may well serve as an exemplary model.

The total sales for the period amount to \$9,950,207, divided as follows:—

	Dols.
Sales of aeroplanes .....	6,588,806
Aeroplane parts .....	1,433,101
Sales of motors .....	1,405,689
Motor parts .....	495,715
Miscellaneous .....	26,896

Gross sales .....	9,950,207
Discounts and commissions .....	72,926
Net sales .....	9,877,281
Manufacturing cost .....	7,163,642
Operating profit .....	2,713,639
Selling, general expenses, etc. ....	764,059
Balance .....	1,949,579
Other income .....	152,453
Gross profit .....	2,102,032
Bond and other interest .....	209,886
Royalties .....	70,600
*Net profit .....	1,821,566

\*After allowing \$315,000 as dividend for nine months on the \$6,000,000 preferred stock this leaves \$1,506,566 for the 217,000 shares of common stock or \$6.90 a share for the period. This is at an annual rate of \$9.20 a share for the junior issue which is without par value. No allowance has yet been made for war taxes.

Balance-sheet of the Curtiss Aeroplane and Motor Corp. and subsidiaries, as of Sept. 30th, 1917, compares with statement of Nov. 30th, 1916, as follows:—

	ASSETS.	
	Sept. 30, '17. Dols.	Nov. 30, '16. Dols.
Land, buildings, equipment, etc. ....	*3,675,918	*1,163,711
Cash .....	142,101	280,256
Account and notes rec., less reserve....	1,992,501	1,063,565
Inventories, less reserve .....	6,476,749	2,470,982
Investments .....	37,170	.....
Deposits on contracts .....	.....	103,743
Patents and good will .....	5,853,461	7,835,590
Deferred charges .....	337,268	287,773
Total .....	18,515,169	13,195,621
	LIABILITIES.	
	Dols.	Dols.
Capital stock .....	†7,087,700	6,750,000
Bonds .....	3,773,000	.....
Notes .....	.....	4,000,000
Accounts and notes payable .....	4,422,030	615,934
Other current liabilities .....	106,092	.....
Minority interest, Toronto Co. ....	.....	58,689
Accrued interest, taxes, wages .....	159,970	.....
Reserve for contingencies .....	96,429	35,000
Deposits on contracts .....	762,709	911,524
Profit and loss surplus .....	2,107,139	824,474
Total .....	18,515,169	13,195,621

\*Depreciated valuation.

†Comprises \$6,000,000 preferred stock and \$1,515,000 common stock, less \$427,300 (85,460 shares) with trustee for conversion of notes.

The new plant of the company was to be completed before the end of 1917. Beginning Jan. 1st, the Curtiss Co. was to turn out more than \$9,000,000 of aeroplanes and parts a month. Of this record business \$4,000,000 will be taken care of in the old plants and \$5,000,000 in the plants to be completed this week.

Work has already begun on machines for the Government in several of the departments. The six months' business is estimated at \$50,000,000. It is estimated that the company will be in a position by the close of next year to turn out close to \$20,000,000 of aeroplane material a month or at an annual rate of \$240, 000, 000.

These accounts and these results are highly satisfactory from every point of view. Directors, managers, as well as the shareholders, are to be congratulated.

G. A.



**AVERAGING EXCESS PROFITS DUTY.**

"Manufacturer" raises a point in connection with this much vexed subject which will no doubt interest many similarly situated. He states that in consequence of the rise in cost of raw materials, increased wages and additional expenses, the results of his trading during the war period have varied in such degree that one year he made a profit which made him liable to pay Excess Profits duty and subsequently the result was adverse, and he was not liable under this head. "Manufacturer" writes to inquire if he is enabled in the circumstances to claim any refund of his past payments.

The Finance Act (No. 2) 1915, Part 3, Section 38, Sub-Section 3, specially provides for the above contingencies, and the following is an exact copy of the wording of the Act:—

"Where a person proves that in any accounting period, which ended after the fourth day of August nineteen hundred and fourteen, his profits have not reached the point which involves liability to excess profits duty, or that he has sustained a loss in his trade or business, he shall be entitled to repayment of such amount paid by him as excess profits duty in respect of any previous accounting period, or to set off against any excess profits duty payable by him in respect of any succeeding accounting period, such an amount as will make the total amount of excess profits duty paid by him during the whole period accord with his profits or losses during that period."—G. A.

**COMPANY ANNOUNCEMENTS.****MORTGAGES AND CHARGES REGISTERED.**

**EASTBOURNE AVIATION CO., LTD.** (late Frank Hucks' Water-plane Co., Ltd.) Registered Dec. 22nd, 1917. £7,352. Debentures as a general charge on the company's undertaking and assets.

**FAIREY AVIATION CO., LTD.** (Hayes).—Registered Dec. 14th, 1917. Mortgage securing all sums as may be advanced from time to time to the Ministry of Munitions. Charged on land and buildings at Harlington (exclusive of plant, machinery, etc.).

**GRAHAME-WHITE AVIATION CO., LTD.** (late Grahame-White, Blériot & Maxim, Ltd.).—Registered Dec. 19th, 1917. Debenture, £80,000, charged on the company's interests and rights under any subsisting contracts with the Ministry of Munitions also a general charge on the company's undertaking and assets.

**NEW COMPANIES REGISTERED.**

The files of the following new companies registered with the nominal capitals of £5,000 and upwards are now available for inspection at Somerset House:—

**ALPHAERO ENGINES (FOREIGN PATENTS) (LTD.).**—Jan. 5th. £10,000 in £1 shares. 57, Gracechurch Street, E.C.

**P. D. V. AIRCRAFT CO. (LTD.).**—Jan. 2nd. £10,000 in £1 shares. Prince Street, Richmond, Surrey.

**CAMBRIAN AIRCRAFT CONSTRUCTORS, LTD.** Registered Dec. 24th, 1917. Nominal capital, £110,000, divided into 100,000 Cumulative and Participating Preference shares of £1 each, and 200,000 Ordinary shares of 1s. each.

**SMITH AND EWEN (AEROPARTS), LTD.** Registered Dec. 27th, 1917. Nominal capital, £5,000, in £1 shares. Registered Office, 42, Frederick Street, Birmingham.

**ANSWERS TO CORRESPONDENTS.**

*Inquiries on any subject affecting or relating to Investments, Stocks, Shares and Securities of Aircraft and kindred companies will be answered in these columns (free of charge).*

"COMPLEX."—The mortgagor in paying interest should deduct the tax payable on the amount of the interest and should account for the sum retained in his "Income-tax Return."

"STUDENT."—All companies are governed and regulated by the Companies Acts. The following now comprises all the "operative" legislation:—The Companies (Consolidation) Act, 1908, consisting of 296 Sections and 5 Schedules. The Companies (Amendment) Act, 1913—2 Sections and 1 Schedule. The Companies (Foreign Interests) Act, 1917—3 Sections; and the Companies (Particulars as to Directors) Act, 1917. 4 Sections.

"ENQUIRY."—There is no trace of any company under the title you mention.

"MOTOR" (Birmingham).—The sole person in a position to act in relation to a company in liquidation is the Liquidator. The directors' powers cease and no further responsibility attaches to them as and from the date of the Liquidator's appointment.

"ACCOUNTS" (City) inquires which is the correct figure to take where two quotations are given for securities, recording the market value. For account purposes the usual course is to take the "middle" quotation, thus 2½-3 would be recorded as £2 17s. 6d.

"VACILLATE" (Norbury).—Though you may have signed a proxy in favour of the directors for the annual meeting, your attendance at the meeting would permit you to vote as you may desire, as the effect of your presence at the meeting would be to cancel the proxy you sent in.

"PADDY" (Dublin).—The company is a private one, and consequently they are not compelled to file any balance-sheet with the Registrar of Joint Stock Companies, but all the information required by the Companies (Consolidated) Acts has been duly filed. There is consequently no means of ascertaining the financial position. I quite agree with you that this is very unsatisfactory, but nothing can be done so long as the law remains as at present framed.

"INVESTOR."—The "B" Preference shares of the Aircraft Manufacturing Co., Ltd., are both Cumulative and Participating. They are entitled to a fixed annual dividend of 7 per cent. and to rank for a further participation of 20 per cent. of the profits.

**FORCE OF HABIT.**

Mr. Henry John Lawson, the financier, was arrested at Golder's Green on Jan. 7th and taken to Bow Street, where he was brought before the magistrate on Jan. 8th.

The charge against Mr. Lawson is that he conspired to obtain sums of money by means of alleged company frauds.

Detective-Inspector Crutchett and Sergeant Brewer, of New Scotland Yard, met Mr. Lawson soon after he left his home in Woodstock Avenue, Golder's Green, and after reading the warrant for his arrest conveyed him to Bow Street Police Station.

**SAGECRAFT.**

The task of reviewing the apparently endless stream of domestic literature which is being published by the different works engaged in aircraft construction is becoming almost as hopeless as the work of Mrs. Partington, who tried to sweep the Atlantic out of her house with a mop. As quickly as one attempts to read a new production, the postman arrives with something still newer. Nevertheless, this flood of works literature is a distinctly healthy sign, because it shows that some, at any rate, of the many engaged on aircraft construction are beginning to take a real interest in the firms which employ them and their work.

The house of Fredk. Sage and Co., Ltd., of London and Peterborough, have produced the first number of a magazine called "Sagecraft," which is dated Dec., 1917. Among other interesting news, "Sagecraft" records the intention of Mr. Turnbull, who has been so successful in designing Sage propellers, to return to Canada in the near future. The editor also records the departure from the firm of Mr. H. Volk, who was works manager for a considerable period. The staff expressed their esteem for Mr. Volk by presenting him with a silver cigarette cabinet. The departure of Mr. Volk has brought to Peterborough Mr. Stanley Hawes, from the head office in London, who will assume the position of works manager.

It is also recorded that selected employees, chosen by ballot, have been given flights in one of the works' machines, piloted by Mr. Gordon England. A scheme worthy of commendation, in that it gives the whole works an active interest in their productions.

"Sagecraft" contains interesting verses and material contributed by employees, together with some quite good sketches of local persons and things. One looks forward with interest to future numbers of "Sagecraft."

**CURRENT SHARE QUOTATIONS.**

Aircraft Mfg. Co. 7½% cum. pref. £1 ... 28- 24/-	General Electric 6½% cum. pref. £10 ... 10½ 10½	Triplex Safety Glass, £1 ordinary ... 24/- 25/-
7½% cum. & ptg. "B" ... 19½ 20	Co., Ltd. £10 ordinary ... 19½ 20	Vickers, Ltd., 5½% pref. stock ... 78 82½
pref., (fully paid) ... 22/- 23/-	Gwynnes, Ltd., 5½% cum. pref. ... 94/- 95/-	5½% pref. shares. £1 ... 17/6 18/-
Armstrong (Sir W. G.) Whitworth & Co., Ltd. 4½% cum. pref. £5 ... 3½ 3½	Ordinary ... 14/- 15/-	£1 ordinary ... 43/- 44/-
5½% 2nd. pref. £1 ... 17/- 18/-	Greenwood & Batley, Ltd., £10 ordinary ... 9½ 10	Wm. Beardmore & Co., Ltd., 6½% c. pf. £1 19/- 20/-
£1 ordinary ... 42/- 43/-	Humber, Ltd., 6½% cum. pref. £1 ... 14/- 15/-	
Austin Motor Co., Ltd. 7½% cum. pref. £1 ... 18/- 19/-	£1 ordinary ... 21/- 22/-	
£1 ordinary ... 25/- 26/-	Napier (D) & Son, Ltd., 7½% cum. pf. £1 18/- 19/- x	
Birmingham Small Arms Co., Ltd. £1 ordinary ... 54/- 55/-	Peter Hooker, Ltd., £1 7½% cum. partic. 1st pref. 19 20/-	
5½% cum. "A" pref. 4½ 4½	Rolls Royce, Ltd., £1 ordinary ... 63/- 64/-	
6½% cum. "B" pref. 20/- 21/-	Rudge Whitworth, Ltd., £1 ordinary ... 50/- 51/-	
Boulton & Paul, Ltd., 5½% cum. pref. £1 ... 4½ 4½	Ruston, Proctor & Co., Ltd. £1 ordinary ... 28/- 29/-	
Brown Bros., Ltd., 6½% cum. pref. £5 ... 4½ 4½	& Co., Ltd. 15½% cum. pref. £1 ... 16/- 17/- x	
Darracq (A) & Co., £1 ordinary ... 22/- 23/- x	Sunbeam Motor Car Co., Ltd., £1 ord... 79/- 80/-	
(1905) Ltd. 7½% cum. pref. £1 ... 22/- 23/- x	Straker Squire, Ltd. (1913), £1 ordinary 22/- 23/-	
Electric Construction Co., Ltd. £1 ordinary ... 24/- 25/-	S. Smith & Son, Ltd. (Motor Accessories) £1 ordinary ... 26/- 27/-	
Fellows Magneto Co., 8½% cum. partip. pref. ... 16/- 17/-		

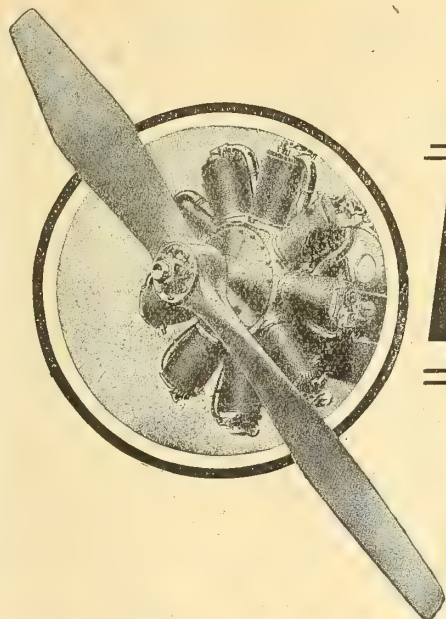
**GENERAL INFORMATION.**

Armstrong, Whitworth (1916).  
Austin Motor (1916).  
B'ham. Small Arms (1915-16).  
Rolls Royce.  
Rudge Whitworth.  
Straker-Squire (1915).  
Sunbeam Motor.  
Thornycroft (J. I.) & Co.  
Vickers (1915 and 1916).

Owing to the difficulty of estimating liabilities under Finance and Munitions Acts, the accounts will not be ready until a later date.

x—ex dividend





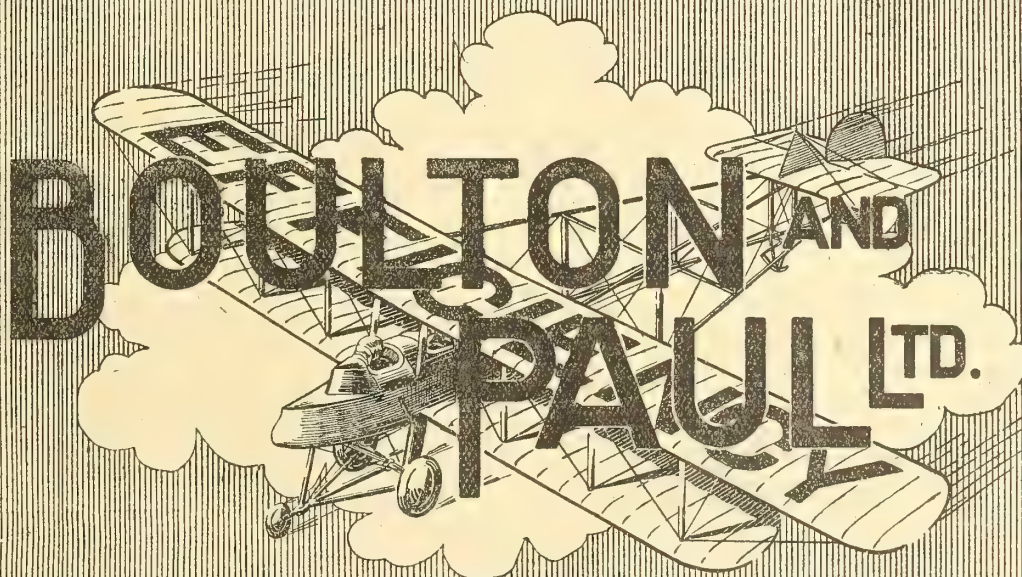
# AERO ENGINES



**W. H. ALLEN, SON & CO. L<sup>TD</sup>.**  
**QUEEN'S ENGINEERING WORKS, BEDFORD,**  
**ENGLAND.**

TELEGRAMS "AVIATION" NORWICH.

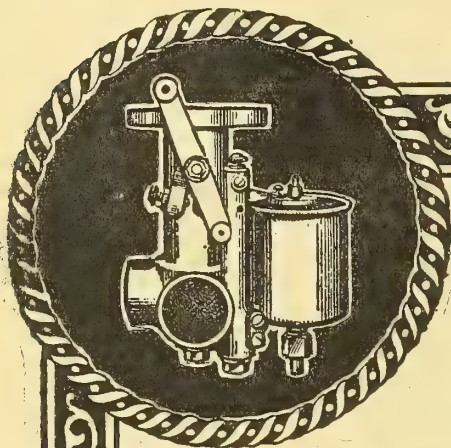
PHONE NO 851 NORWICH



**AIRCRAFT WORKS NORWICH**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





# ZENITH

## CARBURETTOR

Send for  
Illustrated Booklet.

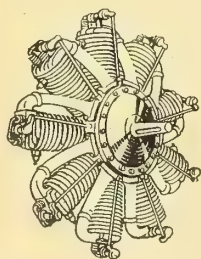
ZENITH CARBURETTOR CO., LTD. 40-42 Newman St. LONDON, W.1.

Where swiftness,  
efficiency, and reli-  
ability are needed  
in the Government  
Service—there you  
will find the  
Zenith Carburettor

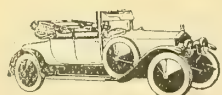
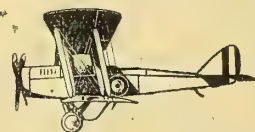
TEL. 4000-77 4000

# F. W. BERWICK

## CO., LTD.



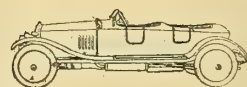
**AEROPLANE & AERO  
Engine Manufacturers  
TO THE AIR BOARD**



**PARK ROYAL, LONDON, N.W.10.**

Telephone: 2490 Willesden (5 lines). Telegrams: "Berwicks, Harles, London."

*Proprietors and Manufacturers of the Sizaire-Berwick Car.*





*(Continued from page 314.)*

He has in addition brought down several enemy machines, and has always set a splendid example of fearlessness and devotion to duty in attacking enemy balloons and troops on the ground.

Temp. Sec. Lt. LESLIE ARCHIBALD POWELL, Glouc. R. and R.F.C.

For conspicuous gallantry and devotion to duty on several occasions in attacking enemy aircraft in superior numbers at close range, destroying some and driving down others out of control. He has also done excellent work on photographic reconnaissances, and has in every instance displayed the greatest gallantry and splendid offensive spirit.

Sec. Lt. JONATHAN GUMERSAL SHARP, R.G.A., Spec. Res. and R.F.C.

When on patrol his machine was brought down by an anti-aircraft gun and turned completely over on landing, pinning the pilot underneath. Sec. Lt. Sharp, who had been thrown clear, immediately went to his assistance and pulled him out. They then ran towards the canal, which they swam, and reached our lines in safety. From the moment their machine was hit until they reached our lines they were under continual fire, but both escaped unwounded.

Sec. Lt. CHARLES KINGSFORD SMITH, R.F.C., Spec. Res.

He has himself brought down four machines during his first month at the front, and has done most valuable work in attacking ground targets and hostile balloons. Of the latter he forced at least nine to be hauled down by his persistent attacks, during which he was repeatedly attacked himself by large hostile formations, and his efforts undoubtedly stopped all hostile balloon observation during a critical period. His efforts and fine offensive spirit and disregard of danger have set a very fine example.

Temp. Lt. GORDON KEITH SMITH, Gen. List, R.F.C.

When on long-distance bombing raids during a period of four months he has consistently shown great dash and determination—on two occasions attacking aerodromes from low altitudes in spite of anti-aircraft fire, and bringing back valuable information.

Temp. Sec. Lt. RICHARD DOUGLAS STARLEY, Gen. List and R.F.C.

When he had located a large force of the enemy infantry who were about to counter-attack, his machine was immediately afterwards hit by a shell, which destroyed the wireless, and so prevented his reporting what he had seen. His machine was obviously so badly damaged that no expert would have believed that it could possibly hold together in the air. In spite of this he went down and dropped a message on Divisional Headquarters, who were able to put nine batteries on to the counter-attack. He then managed to get his machine back to the aerodrome and confirmed the message by telephone. Throughout the operations he has on all occasions shown the same spirit of pluck and determination.

Temp. Lt. JOHN AFFLECK STEVENSON, Gen. List and R.F.C.

For conspicuous gallantry and devotion to duty as a balloon observer. Working under very great difficulties owing to a high and gusty wind, he has furnished invaluable information to our artillery, continually ranging them on hostile batteries with complete accuracy and success in spite of the difficulties

with which he had to contend. He has at all times set a very fine example of pluck and determination.

Sec. Lt. ST. CYPRIAN CHURCHILL TAYLER, R. Suss. R. and R.F.C.

For conspicuous gallantry and devotion to duty in leading offensive patrols against enemy aircraft. On five occasions at least he and his patrol have attacked and brought down hostile machines. These successes were almost entirely due to his very skilful piloting.

Temp. Sec. Lt. ROBERT NAYLOR TREADWELL, Gen. List and R.F.C.

Although very severely wounded during a combat, he succeeded in bringing back his machine against a very strong wind to his aerodrome, saving both machine and observer by his great pluck and determination. When lifted out of his machine he was utterly exhausted. He has been concerned in many successful patrols and bomb raids, showing on all occasions conspicuous dash and devotion to duty.

Lt. (Temp. Capt.) FRANCIS McDUGALL CHARLEWOOD TURNER, R.F.C., Spec. Res.

For conspicuous gallantry and devotion to duty as leader of long-distance bombing raids and on photographic reconnaissances. He has taken part in many successful operations, in 24 of which he has acted as leader, and by his skill and determination has invariably done good work in spite of very adverse weather conditions, and though more than once attacked by enemy formations in greatly superior numbers to his own. He was the first officer to carry out a single machine long-distance reconnaissance successfully, and has been more than once congratulated for the excellence of his photographic work.

Temp. Lt. WILLIAM WALLACE, Gen. List and R.F.C.

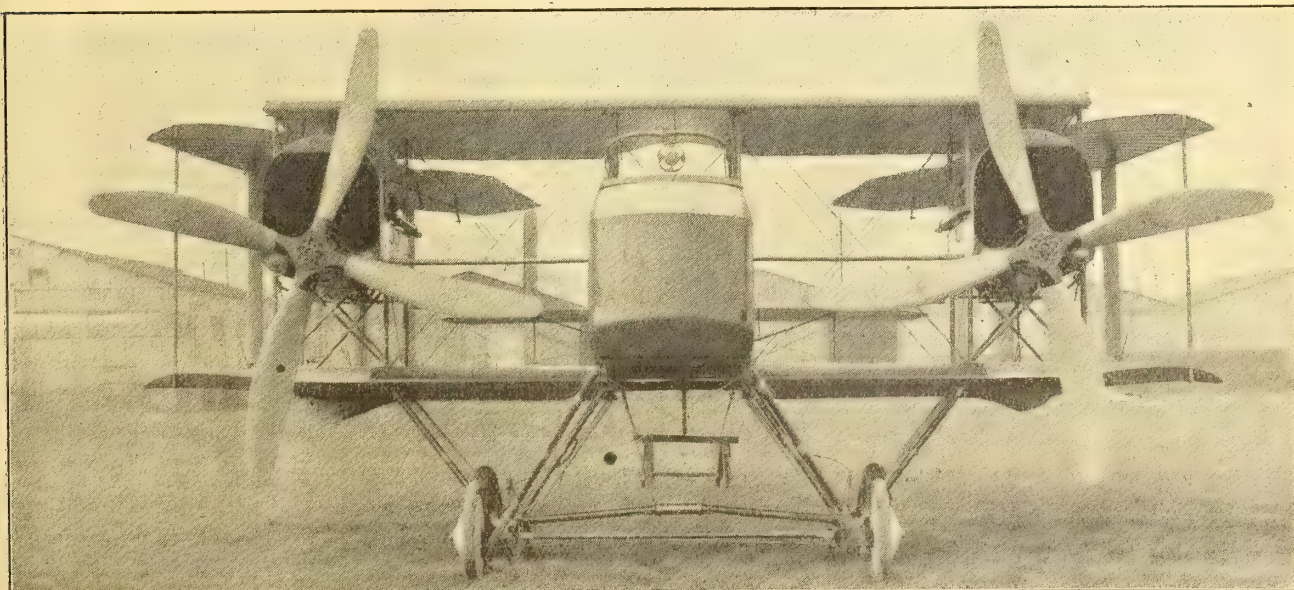
For conspicuous gallantry and devotion to duty when co-operating with artillery. He has consistently shown great skill as an observer, ranging siege batteries on hostile batteries with such accuracy that very severe damage was inflicted on the enemy. He has been responsible for the destruction of at least two hostile batteries and has carried out most valuable work for a very long period.

Temp. Sec. Lt. CLIVE WILSON WARMAN, Gen. List and R.F.C.

He has on all occasions proved himself to be an exceptionally skilful and gallant pilot, having in the space of six weeks brought down six machines and destroyed a hostile balloon. He has also driven down at least five other enemy machines, displaying a consistent determination to attack at close range regardless of personal danger.

Sec. Lt. GEORGE ALFRED WELLS, R.F.C., Spec. Res.

For conspicuous gallantry and devotion to duty in engaging enemy infantry with machine-gun fire from low altitudes and attacking enemy aircraft. On one occasion, whilst attacking enemy strong points his machine was so badly shot about that he was forced to return to his aerodrome. He resumed his patrol, however, as soon as he had obtained another machine, and on the following day he attacked a series of strong points with machine-gun fire, flying at a very low altitude for 40 minutes under intense machine-gun fire and field-gun barrage. He was eventually wounded in three places in the arm, but in spite of this he returned to his aerodrome and landed his machine safely.



The Fairey Twin-engined Folder Biplane Folded.



Lt. (Temp. Capt.) HENRY DANIEL WILLIAMS, R.F.C., Spec. Res.

For conspicuous gallantry and devotion to duty whilst carrying out artillery observation. Although attacked by two machines, he carried on with his work, driving one off and destroying the other. He has consistently shown courage and perseverance in carrying out his work, and set a very fine example to his squadron.

Temp. Sec. Lt. ERIC WILSON, Gen. List and R.F.C.

When he was in one of three machines engaged on photographic reconnaissances they were attacked by a formation of nine hostile scouts. A determined resistance was offered to this attack, which was beaten off, and the photographs were then taken. Whilst returning to the aerodrome, this officer turned back alone to take some further photographs, and, observing six hostile machines approaching, he promptly attacked them at close range, and after a sharp fight brought one down and drove off the remainder. He then completed his photography.

Temp. Lt. (Temp. Capt.) HENRY WINSLOW WOOLLETT, Gen. List and R.F.C.

For conspicuous gallantry and devotion to duty in engaging three enemy aircraft and following them down to a low altitude behind the enemy's lines, destroying one and driving down another out of control during the operations. He has done great work as a patrol leader, and has always displayed great gallantry in aerial combats, having brought down three other enemy machines in addition to those already mentioned.

Sec. Lt. ALFRED CLARENCE YOUNDALE, R.F.C., Spec. Res.

Working in conjunction with our infantry, he rendered valuable assistance in the attack, flying several times through our heavy barrage and using his machine-gun at a very low altitude. His work has been consistently skilful and fearless during the whole of the operations, especially when engaged in contact patrols and in attacking enemy infantry from low altitudes.

#### CANADIAN FORCE.

Lt. DAVID LUTHER BURGESS, Inf., attd. R.F.C.

For conspicuous gallantry and devotion to duty in aerial fighting and on photography. As observer he has taken a large number of very successful photographs in spite of bad weather and continual opposition from the enemy. On four occasions at least he has assisted his pilot to drive down and destroy hostile aircraft.

Lt. GEORGE CLARENCE ROGERS, Inf., attd. R.F.C.

For conspicuous gallantry and devotion to duty on several occasions. He has rendered valuable service to the artillery in ranging them on hostile batteries. In order to carry out the shoots successfully he has flown long distances over the line under very heavy anti-aircraft fire, returning in nearly every case with his machine badly damaged by pieces of shell; and, although frequently attacked by hostile aircraft, he engaged and drove them off with scarcely any interruption to the shoot.

#### WAR OFFICE, Jan. 9th.

REGULAR FORCES.—STAFF.—The following temp. appts. are made at the War Office:—Dir.—Capt. (temp. Lt.-Col.) A. Huggins, D.S.O., R.F.C., Spec. Res., from a Depot Comdr., R.F.C., and to be temp. Brig.-Gen. whilst so emplyd., vice Bt. Lt.-Col. W. B. Caddell, R.A., Dec. 22nd, 1917.

ESTABLISHMENTS.—R.F.C.—MIL. WING.—Special Appt.—(Graded as a Sqdn. Comdr.)—Lt. (temp. Capt.) R. H. Carr, Spec. Res., a Flt. Comdr., and to be temp. Maj. whilst so emplyd., Nov. 1st, 1917.

Flt. Comdrs.—And to be temp. Capt. whilst so emplyd.:—Lt. A. H. George, Ches. R., T.F., Oct. 7th, 1917. From Flying Officers:—Lt. D. Stewart, R.G.A., T.F.; Lt. A. J. Bott, M.C., R.G.A., Spec. Res., Dec. 22nd, 1917.

INSTR. IN GUNNERY.—(Graded as an Equipt. Officer, 1st Cl.)—Capt. A. J. G. Anderson, Lond. R., T.F., from an Instr. (graded as an Equipt. Officer, 1st Cl.), Schools of Aerial Gunnery, Nov. 8th, 1917.

Adjts.—Lt. C. E. Morgan, ret., and to be temp. Capt. (with pay and allowances as Lt.) whilst so emplyd., vice Lt. F. S. Isaac, Worc. R., Spec. Res., Aug. 31st, 1917 (substituted for the notification in the "Gazette" of Sept. 26th, 1917). Lt. (temp. Capt.) T. M. Eggar, Lond. R., T.F., Sept. 6th, 1917 (substituted for the notification in the "Gazette" of Oct. 12th, 1917). Lt. (temp. Capt.) C. A. M. Holloway, R.W. Kent R., relinquishes his temp. rank on ceasing to hold his appt., Nov. 26th, 1917.

Depot Comdr.—Bt. Lt.-Col. (temp. Brig.-Gen.) W. B. Caddell, R.A., to relinquish his temp. rank, and to be temp. Lt.-Col. whilst so emplyd., Dec. 22nd, 1917.

Equipt. Officers, 1st Cl.—From the 2nd Cl., and to be temp. Capt. whilst so emplyd.:—Lt. G. D. Etches, Spec. Res., Dec. 22nd, 1917. Lt. G. G. Lever, R. Fus., Spec. Res., Dec. 23rd, 1917.

SCHOOLS OF INSTRN.—CENTRAL FLYING SCHOOL.—Comdt.—Capt. (temp. Lt.-Col.) A. J. L. Scott, M.C., Yeo., T.F., a Wing

Comdr., and to retain his temp. rank whilst so emplyd., Nov. 23rd, 1917.

SCHOOLS OF MIL. AERONAUTICS.—Instr.—(Graded as a Flt. Comdr.)—Capt. C. O. Fairbairn, N. Lan. R., Spec. Res., relinquishes his appt. on resuming the appt. of Flt. Comdr., Dec. 5th, 1917.

SCHOOLS OF AERIAL GUNNERY.—Asst. Instr.—(Graded as an Equipt. Officer, 2nd Cl.)—Lt. W. N. Spragg, Spec. Res., an Equipt. Officer, 3rd Cl., Oct. 19th, 1917.

SCHOOLS OF TECHNICAL TRAINING.—Chief Instr.—(Graded as a Park Comdr.)—The appt. of Lt. (temp. Capt.) C. G. Tucker, Spec. Res., notified in the "Gazette" of Oct. 3rd, 1917, is post-dated to Sept. 17th, 1917.

Instrs.—(Graded as Equipt. Officers, 1st Cl.)—From graded as Equipt. Officers, 2nd Cl., and to be temp. Capt. whilst so emplyd., Sept. 14th, 1917:—Lt. J. D. Troup, Spec. Res.; Sec. Lt. (temp. Lt.) W. Millett, Gen. List; Temp. Lt. J. Jensen, Gen. List, from an Asst. Instr. (graded as an Equipt. Officer, 2nd Cl.), and to be temp. Capt. whilst so emplyd.

Asst. Instrs.—(Graded as Equipt. Officers, 2nd Cl.)—Equipt. Officers, 3rd Cl., and to be temp. Lts. whilst so emplyd.:—Sec. Lt. H. I. Allen, Spec. Res.; Sec. Lt. R. G. Whitcombe, Spec. Res.; Temp. Sec. Lt. G. E. Bower, Gen. List, to Dec. 16th, 1917, inclusive. Sec. Lt. D. Richardson, Spec. Res.; Temp. Sec. Lt. F. E. Cooper, Gen. List, Sept. 14th, 1917.

#### WAR OFFICE, Jan. 10th.

REGULAR FORCES—ESTABLISHMENTS—R.F.C.—MIL. WING.—Flt. Comdrs.—Sec. Lt. W. A. Forsyth, R.A., from a Flying Officer, and to be temp. Capt. while so emplyd., June 30th, 1917; Capt. C. Fawcett, R. Suss. R., T.F., from a Flying Officer (Obsr.), Sept. 15th, 1917. Lt. A. R. Boeree, Suff. R., T.F., from a Flying Officer, and to be temp. Capt. while so emplyd., Oct. 5th, 1917. Capt. F. H. Mardall, Ind. Inf., from a Flying Officer, Nov. 3rd, 1917. From Flying Officers, and to be temp. Capt. while so emplyd.:—Temp. Lt. F. M. Kitto, Gen. List, Dec. 1st, 1917; Sec. Lt. (temp. Lt.) A. G. Bond, S. Lan. R., Dec. 10th, 1917; Lt. A. H. Orlebar, Bedf. R., T.F., Dec. 20th, 1917; temp. Sec. Lt. C. Cornelius-Wheeler, Gen. List, Dec. 22nd, 1917.

Adjts.—Temp. Sec. Lt. A. F. Nimmo, Cam'n Highrs., and to be temp. Capt. (with pay and allowances as Lt.) whilst so emplyd., vice Lt. (temp. Capt.) C. W. Wise, A.S.C., Spec. Res., Oct. 27th, 1917. Capt. C. V. Beresford, Worc. R., Dec. 3rd, 1917.

Equipt. Officers, 1st Cl.—Lt. (temp. Capt.) F. G. Hogarth, Spec. Res., from the 2nd Cl., and to retain his temp. rank whilst so emplyd., Aug. 24th, 1917.

Gen. List.—To be temp. Sec. Lt.—2nd Cl. Air Mech. J. A. Hesselden, from R.F.C., Oct. 19th, 1917.

#### WAR OFFICE, Jan. 11th.

REGULAR FORCES—ESTABLISHMENTS—R.F.C.—MIL. WING.—Sqdn. Comdrs.—From Flt. Comdrs., and to be temp. Maj. whilst so emplyd.:—Temp. Sec. Lt. (temp. Capt.) K. R. Binning, M.C., Gen. List, Nov. 7th, 1917. Capt. O. A. Westendarp, Lond. R., T.F., Nov. 24th, 1917.

Equipt. Officers, 1st Cl.—From the 2nd Cl.:—Capt. C. Higham, Manch. R., T.F., Oct. 1st, 1917. And to be temp. Capt. whilst so emplyd.:—Lt. J. C. Forsyth, Spec. Res., Sec. Lt. (temp. Lt.) E. Rivers-Smith, Spec. Res., Sec. Lt. (temp. Lt.) A. Young, Spec. Res., Nov. 1st, 1917. Lt. W. J. Sinclair, Spec. Res., Sec. Lt. (temp. Lt.) J. A. Cowling, Spec. Res., Dec. 1st, 1917. Temp. Capt. L. M. Lilley, Gen. List, Dec. 7th, 1917. Capt. C. H. Awcock, R.A., Dec. 20th, 1917. Lt. H. Loeffler, Spec. Res., Jan. 1st.

SCHOOLS OF INSTRN.—SCHOOLS OF MIL. AERONAUTICS.—Examining Officer (graded as Flt. Comdr.)—Temp. Lt. W. H. Dolphin, Gen. List, from a Flying Officer, and to be temp. Capt. whilst so emplyd., Nov. 28th, 1917.

MEMORANDUM.—Joseph Beck to be temp. hon. Lt. whilst emplyd. as Asst. Insp., Aeronautical Inspn. Dept., June 1st, 1917.

Serjt. J. A. McCudden, R.F.C., to be Sec. Lt. whilst serving with R.F.C., Dec. 17th, 1917.

#### WAR OFFICE, Jan. 12th.

REGULAR FORCES—ESTABLISHMENTS—R.F.C.—MIL. WING.—Sqdn. Comdr.—Capt. C. Mackay, M.C., Leins. R., Spec. Res., from a Flt. Comdr., and to be temp. Maj. while so emplyd., Dec. 23rd, 1917.

Flt. Comdrs.—From Flying Officers:—Temp. Capt. C. H. Brewer, Bedf. R., Dec. 19th, 1917. Capt. V. E. Schweitzer, Canadian Exped. Force, Dec. 30th, 1917. And to be temp. Capt. whilst so emplyd.:—Lt. O. E. Ridewood, A.S.C., T.F., Dec. 19th, 1917. Lt. W. U. Dykes, Sco. Rif., Spec. Res., Dec. 23rd, 1917. Temp. Lt. J. C. Liddle, Gen. List, Dec. 26th, 1917. Lt. F. R. Hudson, Spec. Res.; Lt. E. Pownall, L'pool R., T.F.; Lt. F. L. Luxmoore, Spec. Res.; temp. Lt. C. J. Marchant, Gen. List; temp. Lt. L. Reynolds, Gen. List; Sec. Lt. (temp. Lt.) E. A. Lloyd, Yeo., T.F., Jan. 1st.

Adjts.—Capt. G. H. Errington, N. Staff. R., Spec. Res., and to be sec'd., Jan. 3rd. And to be temp. Capt. (with pay and allowances as Lt.) whilst so emplyd.:—Lt. W. L. Dingley, Ches. R., T.F., and to be sec'd., Dec. 22nd, 1917. Lt. A. C. Workman, R. Ir. Rif., Spec. Res., and to be sec'd., Dec. 27th, 1917.





Cast iron  
Pulley Wheel  
about 5 feet in  
diameter with  
large piece  
broken out of  
rim.

288

## Let Barimar Repair your Factory Machinery

Nothing in the way of welding is beyond the scope of Barimar Welding Specialists.

Whenever a breakage occurs, send the part to Barimar at once. That will save you valuable time, and you will get a sound job at a reasonable price, plus a guarantee to refund money if repair proves ineffective.

Barimar Welding Service is used by practically all Government Departments and by the leading Munition Works. You cannot go wrong if you follow their example.

Get the name "Barimar" impressed on your memory, for it is certain that you will need this service sooner or later.

Meantime, write for **FREE BOOKLET**, "B. C.," entitled "How Barimar Performs Miracles"—a technical journalist's description of Barimar Factory Methods. Please mention "THE AEROPLANE."

### HOW TO SEND REPAIRS.

Remove all fittings. Attach label with your name and address, and send carriage paid. Send full instructions by post.

Address repairs to Dept. B.C.

# BARIMAR

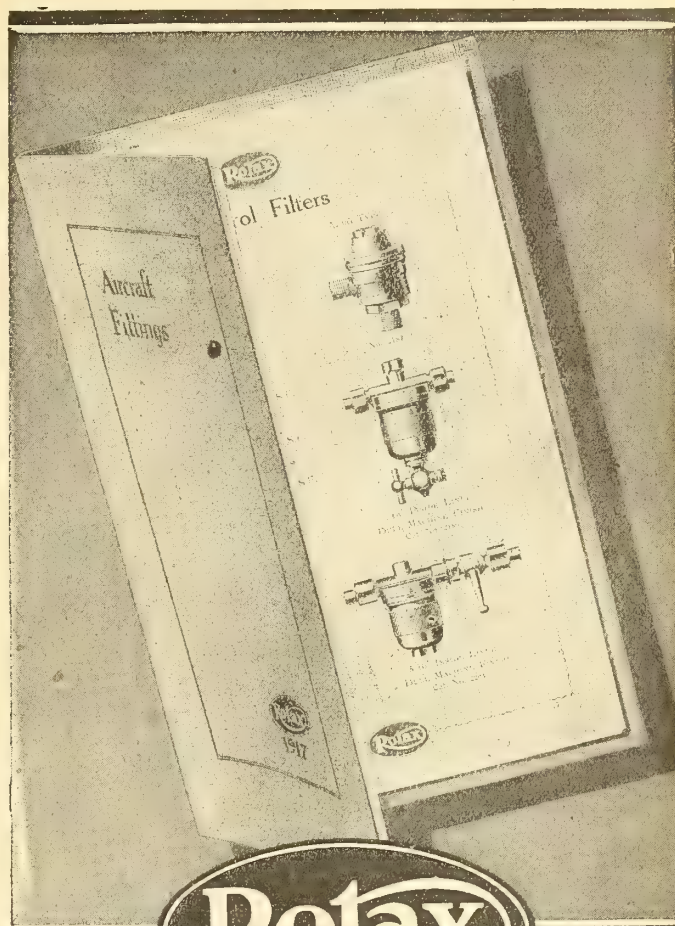
LIMITED.

10, Poland Street,  
Oxford Street, London, W.1.

Wire us—  
Bariguamar, Reg., London.

Phone us—  
Gerrard 8173

Pulley Wheel  
with new part  
welded in,  
machined and  
cleaned up.  
Tested to stand  
same strain as  
original casting.



## A Useful Book of Reference for Manufacturers

A copy of the Catalogue illustrated above  
will be sent to manufacturers on application

DETAILS ARE GIVEN OF OUR  
MANUFACTURES, COMPRISING :

STREAMLINE WIRES AND FITTINGS, BRASS  
AND GUNMETAL FITTINGS, SHACKLES,  
AERO CLIPS, WIND SHIELDS, Etc., Etc.

Special quotations on application to :

## THE ROTAX MOTOR ACCESSORIES Co., Ltd.

Head Offices :

Rotax Works, Willesden Junction, N.W. 10



Temp. Sec. Lt. (temp. Lt.) J. H. Tyler, Gen. List, from a Flying Officer, Jan. 1st.

Gen. List.—Temp. Serjt.-Maj. C. Rapley, from R.F.C., to be temp. Sec. Lt., Dec. 21st, 1917.

E. E. Froneman (Capt., S.A. Inf.) to be temp. Capt. for duty with R.F.C., Aug. 14th, 1917.

**SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—MIL. WING.—Lt. (temp. Capt.) F. N. Shumaker resigns his commn., and is granted the hon. rank of Capt.**

\* \* \*

The following names are among those mentioned in a dispatch from General Sir Archibald Murray, K.C.B., late Commander-in-Chief, Egyptian Expeditionary Force, dated June 28th, 1917:—

#### STAFF.

Fraser, Capt. C., N. Staff. R. (temp. Lt.-Col., R.F.C.).

#### ROYAL FLYING CORPS.

Anne, Temp. Capt. C. E. I. C. (drowned).

Berridge, Temp. Capt. F. D., Gen. List; Bradley, Maj. R. A., N. Staff. R.; Blake, Temp. Capt. W. T., Gen. List; Board, Maj. (temp. Lt.-Col.) A. G., S. Wales Bord.; Brown, Lt. J., Spec. Res.

Carr, Capt. A. G. H., York and Lan. R.

Dempsey, Temp. Capt. J. A. D., Gen. List; Dixon-Spain, Capt. J. E., Hamps. R.

Gardener, Sec. Lt. G. C., R. Ir. R.; Grace, Capt. (temp. Maj.) P. R., Spec. Res.

Jenkins, Lt. R. C., M.C., D. Corn. L.I.

O'Brien, Capt. (temp. Maj.) A. K. H., D. Gds., Spec. Res. (Capt., ret. pay); O'Farrell, Maj. E. H. M., R. Ir. Fus.

Primrose, Capt. (temp. Maj.) W. H., Arg. and Suthd. Highrs.

Seward, Lt. (temp. Capt.) W. E. L., Spec. Res.

Thomas, Lt. H. H., R.F.A.

Baker, No. 246 Flt. Serjt. (temp. Serjt.-Maj.) C. W.; Beer, No. 2192 Serjt. (actg. Flt. Serjt.) W. J.; Calder, No. 1726 Flt. Serjt. D. P.; Cross, No. 2084 Flt. Serjt. W. H.; Holland, No. 1267 Serjt. R. J. H.; Huxter, No. 4256 Serjt. (temp. Serjt.-Maj.) T. J.; Large, No. 12128 Flt. Serjt. J. W.; Osborn, No. 46445 Cpl. W. J.; Phelps, No. 49457 Cpl. R. C.; Prickett, No. 5775, Serjt. (temp. Serjt. Maj.) H. W.; Shaw, No. 26056 1st Cl. Air Mech. (actg. Cpl.) A. J.; Waghorn, No. 204 Flt. Serjt. P. J.

**OVERSEA CONTINGENTS.—AUSTRALIAN IMPERIAL FORCE.—FLYING CORPS.—Ellis, Capt. A. W. L.; Jones, Capt. A. M., M.C.; Turner, Lt. V. P.; Williams, Capt. (temp. Maj.) R., D.S.O.**

Johnston, No. A/332 Flt. Serjt. H.; Robertson, No. A/105 Flt. Serjt. R. S.

#### WAR OFFICE, Jan. 14th.

**REGULAR FORCES—ESTABLISHMENTS—R.F.C.—MIL. WING.**—Staff Officer, 3rd Cl. (Graded as a G.S.O., 3rd Gr.).

Capt. R. C. Boustead, Midd'x R., T.F., and to be sec'd., vice Temp. Capt. R. H. Peto, Gen. List, Oct. 19th, 1917.

Sqdn. Comdrs.—From Flt. Comdrs., and to be temp. Maj. whilst so empld.:—Lt. (temp. Capt.) A. J. Capel, Som. L.I., July 30th, 1917. Temp. Sec. Lt. (temp. Capt.) G. W. M. Green, D.S.O., M.C., Gen. List, Aug. 28th, 1917. Lt. (temp. Capt.) A. de B. Brandon, D.S.O., M.C., Spec. Res., Oct. 1st, 1917. Lt. (temp. Capt.) C. S. Ross, Spec. Res., Oct. 4th, 1917. Temp. Capt. F. W. Honnet, Gen. List, Nov. 2nd, 1917. Sec. Lt. (temp. Capt.) J. R. Gould, K.E. Horse, Spec. Res., Nov. 25th, 1917. Temp. Sec. Lt. (temp. Capt.) R. P. Willock, Gen. List, Dec. 30th, 1917.

Flt. Comdr.—Temp. Sec. Lt. A. Hepburn, Gen. List, from a Flying Officer, and to be temp. Capt. whilst so empld., Jan. 2nd.

Special Appt. (Graded as a Park Comdr.)—Temp. Capt. R. F. Stapleton-Cotton, Gen. List, from an Equipt. Officer, 1st Cl., and to be temp. Maj. whilst so empld., Dec. 13th, 1917.

**SCHOOLS OF INSTRN.—SCHOOLS OF MIL. AERONAUTICS.—Asst. Instr. (Graded as an Equipt. Officer, 2nd Cl.).**—Temp. Sec. Lt. W. J. O. Newton, Gen. List, from an Equipt. Officer, 3rd Cl., and to be temp. Lt. whilst so empld., Dec. 21st, 1917.

**SCHOOLS OF AERIAL GUNNERY.**—Comdt. of a School of Aerial Gunnery (Graded as a Sqdn. Comdr.)—Capt. A. G. H. Carr, York and Lanc. R., T.F., from a Comdt. (graded as a Flt. Comdr.), and to be temp. Maj. whilst so empld., Dec. 4th, 1917.

**INSTRS. IN GUNNERY.**—(Graded as Equipt. Officers, 1st Cl.).—Temp. Lts., Gen. List, from Instrs. in Gunnery (graded as Equipt. Officers, 2nd Clt.), and to be temp. Capt. while so empld.:—C. G. Riley, Aug. 16th, 1917. C. P. H. Gunyon, Nov. 1st, 1917. F. L. Bristow, Nov. 8th, 1917.

\* \* \*

The King has been pleased to approve of the award of the Military Medal for bravery in the field to the following man:—5720 1st Cl. Air Mech. H. Doran, R.F.C. (Belfast).

\* \* \*

The following Russian decorations and medals have been awarded at various dates for distinguished services rendered dur-

ing the course of the campaign. The King has given unrestricted permission in all cases to wear the decorations and medals in question.

#### ORDER OF ST. GEORGE.

##### 4TH CLASS.

Capt. (temp. Maj.) J. VALENTINE, D.S.O., late R.F.C., S.R.

#### ORDER OF THE WHITE EAGLE WITH SWORDS.

Lt.-Gen. Sir D. HENDERSON, K.C.B., D.S.O.

#### ORDER OF ST. STANISLAS.

##### 1ST CLASS.

Bt. Lt.-Col. (temp. Brig.-Gen.) D. S. MACINNES, C.M.G., D.S.O., R.E.

[It is assumed that they were conferred by His Imperial Majesty the Czar before his reign was interrupted by treachery and rebellion. Maj. Valentine died of injuries received while the rebellion was still in progress, and received the Order of St. George for gallantry in action while the troops who were still loyal to His Majesty were fighting the enemy—Ed.]

#### FROM THE COURT CIRCULAR.

YORK COTTAGE, SANDRINGHAM, NORFOLK, Jan. 9th.

The King, attended by Captain B. Godfrey-Faussett, R.N., went to London this morning.

The following Officers had the honour of being received by His Majesty, when the King invested them with the Insignia of the Distinguished Service Order:—

Maj. PAUL MALTBY, R. Welsh Fus., attd. R.F.C.

Capt. CLIVE BEALE, R.F.C.

\* \* \*

His Majesty then conferred decorations as follows:—

#### THE DISTINGUISHED SERVICE CROSS.

Flt. Lt. JOHN MANUEL, R.N.A.S.

#### BAR TO THE MILITARY CROSS.

Lt. VICTOR WHITE, S. Staf. Regt. and R.F.C.

#### THE MILITARY CROSS.

Capt. OLIVER BRYSON, Yeo. and R.F.C.

Capt. CUTHBERT FELLOWES, Yeo. and R.F.C.

Lt. HARRY BARNES, R.G.A., attd. R.F.C.

Lt. WILLIAM DOUGLAS, Lond. Regt. and R.F.C.

Lt. FRANK MENDEZ, R.F.C.

Lt. ERIC POLLARD, R.F.C.

#### THE ALBERT MEDAL.

Capt. OLIVER BRYSON, Yeo. and Flt. Comdr., R.F.C.

Capt. (then Lt.) Bryson, with Sec. Lt. Hillebrandt as passenger, was piloting an aeroplane at an aerodrome, when, owing to a sideslip, the machine crashed to the ground and burst into flames. On disentangling himself from the burning wreckage, Capt. Bryson at once went back into the flames, dragged Lt. Hillebrandt from the machine, and, notwithstanding his own injuries, which were undoubtedly aggravated by his gallant efforts to rescue his brother officer, endeavoured to extinguish the fire on Lt. Hillebrandt's clothing. Lt. Hillebrandt succumbed to his injuries a few days later.

#### NAVAL.

The "London Gazette" of Jan. 8th contained an Order in Council making provision for the pay and emoluments of the Observer Branch of the Royal Naval Air Service. Obsr. officers are to be graded in the following ranks: Obsr. Branch—Prob. Obsr. Officer, Obsr. Sub-Lt., Obsr. Lt., Flt. Obsr., Sqdn. Obsr., Wing Obsr., and Obsr. Capt. Flt. Officers (corresponding rank)—Prob. Flt. Officer, Flt. Sub-Lt., Flt. Lt., Flt. Comdr., Sqdn. Comdr., Wing Comdr., and Wing Capt.

The pay and allowances of Obsr. Officers to be as follows: Prob. Obsr. Officers, 7s. 6d. a day, and, in addition, 3s. per day for each day on which they are required to make ascents. Obsr. Sub-Lts. and officers of higher rank, the pay of their corresponding rank in the Royal Navy, and, in addition—Officers qualified in wireless telegraphy, 5s. a day flying pay, together with 3s. a day skill pay, both payable continuously; Officers not qualified in wireless telegraphy, 5s. a day flying pay, payable continuously.

Flt. Obsrs. and Sqdn. Obsrs. are to be paid at the same rates as if they had served for four or eight years respectively as Lts., Royal Navy, and to rank with Flt. Comdrs. and Sqdn. Comdrs. respectively, but not to rank with Lt.-Comdrs., Royal Navy, until they attain eight years' seniority in the relative rank of Lt. Commissioned service as Obsr. prior to April 2nd, 1917, is to count for increases of pay in the scale of the rank.

Warrt. Officers under training for service as Obsrs. are to receive the pay of their rank, and, in addition, 2s. a day for each day on which they are required to make ascents. On qualification as Obsrs. they are to be given either acting or confirmed rank as Warrt. Officers, second grade, with the pay of the rank and the following allowances: Warrt. Officers qualified in wireless telegraphy, 3s. a day flying pay, together with 1s. a day skill pay, both payable continuously; Warrt. Officers not qualified in wireless telegraphy, 3s. a day flying pay, payable continuously.



# PULVO

## LET US TALK

**L** about the *whether*—whether it is better to wait until you are actually waiting for various small parts or

**WHETHER** it is better to think ahead, to look ahead and to *act ahead*. Rush orders are never very satisfactory—they strain the workers which re-acts detrimentally on later orders; mistakes occur; nerves are unduly strung; and they *cost more*. No; rush orders don't pay you or us.

**THINK** therefore of April and [May work now. *What will you want in stock then?* Decide; then act. We promise, for delivery then, parts ordered now, and, remember

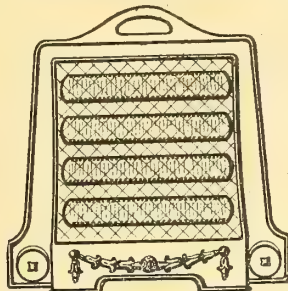
**WHAT PULVO PROMISES  
PULVO PERFORMS.**

**The PULVO ENGINEERING Co. Ltd.**  
10, 12, 14 and 16, DANE STREET,  
HIGH HOLBORN, LONDON, W.C. 1

Telephone :  
Holborn 410

Telegrams :  
Pulvulpt, West-Cent.

## ELECTRICAL APPLIANCES FOR AIRCRAFT Manufacturing Purposes



### ELECTRIC FIRE OFFICE PATTERN.

List No. 617.

An ideal fire for small offices, waiting-rooms, passages, etc. We have also supplied a large number to Aerodromes for general heating.

PRICE 35s.

Dimensions—Height 17 $\frac{3}{4}$  in.,  
Width 17 $\frac{1}{2}$  in., Depth 5 $\frac{1}{2}$  in.



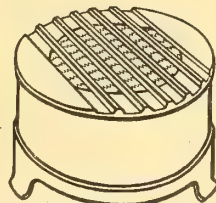
### ELECTRIC AIR-WARMER.

List No. 960.

A reliable low temperature heating appliance, suitable for workrooms, etc. Can be used in any position without risk of fire.

PRICE 25s.

Dimensions—Length, 15 $\frac{1}{2}$  in.,  
Width 6 $\frac{1}{2}$  in., height 4 $\frac{1}{2}$  in.

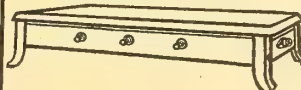


### ELECTRIC BOILING RINGS.

These will do all the same operations as an ordinary g.s. ring. Used for heating ordinary glue pots, and when loaded at 250 watts can be attached to any electric lampholder.

PRICE 15s.

Diameter 7 in.



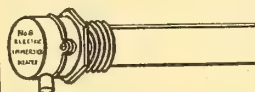
### ELECTRIC HOT-PLATE FACTORY PATTERN.

List No. 18.

Useful for keeping food warm and also for drying purposes of all kinds.

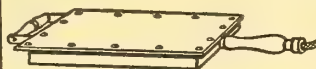
PRICE 100s.

Size 36 in. by 18 in.



### ELECTRIC IMMERSION HEATER.

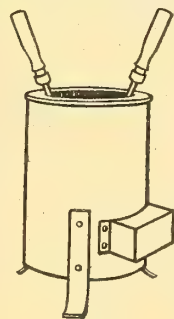
A reliable appliance for heating water oil and other liquids. Can be easily fitted to existing tanks, etc.



### ELECTRIC ENGINE-WARMERS.

For placing under engines in cold weather to prevent freezing. They are quite gas and fireproof.

PRICE 40s.



### ELECTRIC SOLDER POTS.

This is the latest system for heating ordinary soldering irons & consists of a pot of molten solder into which the irons are placed for a short time till heated. All the troubles of flexible cables and the burning out of elements of self-contained electric irons are avoided.

PRICE, with 3 terminals and cover, 65s.

Dimensions: Height, 12 in.; outside diam. 8 in.; inner pan, 5 $\frac{1}{2}$  diam. at top; depth, 7 in.

*All the above prices are subject to an advance of 25 per cent., and to our usual trade discount.*

Our Catalogue illustrates many other special appliances we make for Manufacturing purposes, Munition & Factory work, Hospitals, Mess Rooms, etc.

**BELLING & CO.** Manufacturing  
Elec. Engrs.  
DERRY RD. WORKS, MONTAGUE RD., EDMONTON LONDON, N.18



Flying pay to qualified Obsrs. is to be continued at Admiralty discretion during periods of leave, sickness, internment, or captivity.

The following appointments have been made in the Royal Naval Air Service:—

JAN. 9th.—Sub-Lt. (temp.).—R. Davidson, promoted to Lt. (temp.), seny. Jan. 4th.

Sub-Lt., R.N.V.R. (Temp.).—A. H. Mackenzie, promoted to Lt., R.N.V.R. (temp.), seny. Dec. 4th, 1917.

Temp. commns. as Lt. (R.N.V.R.) have been granted to the following, seny. as stated:—G. Herbert and G. H. W. Dawson, Dec. 31st, 1917; and E. Gibbons, Jan. 14th.

JAN. 10th.—Mr. G. H. Paulin, granted temp. commn. as Lt. (R.N.V.R.), seny. Jan. 9th.

JAN. 12th.—Flt. Sub-Lt. (temp.).—B. C. Woodward, granted temp. commn. as Lt. (R.N.V.R.), seny. Jan. 11th.

W.O., 11 (temp.).—J. E. Wain, granted temp. commn. as Lt. (R.N.V.R.), seny. Jan. 10th.

#### ADMIRALTY COMMUNIQUÉ

JAN. 14th.—At noon on Jan. 13th naval aircraft carried out a bombing raid on Engel dump (north-west of Thourout). Bombs were observed to burst among sheds. A direct hit is reported, and a large cloud of smoke was seen to rise.

All machines returned safely.

#### THE CASUALTY LIST.

Reported Jan. 10th.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED.—

Cuzner, Flt. Sub-Lt. A. E., R.N.

MISSING.—Booth, Flt. Sub-Lt. F., R.N.

Beattie, Flt. Sub-Lt. A. G., R.N.

Dixon, Flt. Sub-Lt. A. J., R.N.

ACCIDENTALLY INJURED.—Pinder, Flt. Lt. J. W., R.N.

Jarrett, Mr. E., Actg. Gunner, R.N.

#### PERSONAL NOTICES.

##### DEATH.

PHILLIPS.—Flt. Sub-Lt. George H. Phillips, R.N., who was drowned on Jan. 7th on active service, was the only son of Mr. and Mrs. Percy C. Phillips, of Alridge, Romford, Essex. He was 18 years of age, and joined the R.N.A.S. in April, 1917. He was educated at St. Cyprians, Eastbourne, and Marlborough, where he was in the Rugby Fifteen in 1916. Both in 1916 and 1917 he won the School cross-country steeplechase, and in 1916 he won the School mile. Lt. Phillips was drowned while on patrol duty in an Eastern theatre of the war.

##### ENGAGEMENTS.

GRABOWSKY—HALES.—An engagement is announced between Flt. Lt. Noel Grabowsky, R.N., eldest son of Carl Grabowsky and Mrs. Grabowsky, and Evelyn Susanna Atherstone Hales, elder daughter of Lt.-Col. H. M. A. Hales, Gloucestershire Regt., late Bedfordshire Regt., and Mrs. Hales.

MCCLEAN—WALE.—A marriage has been arranged, and will shortly take place, between Wing Comdr. F. K. McClean, R.N., and Aileen, daughter of Mr. and Mrs. W. H. Wale, of Lapworth, Warwickshire.

Comdr. McClean is one of the great pioneers of British aeronautics. In 1908-1909 he began experimenting at Leysdown, in the Isle of Sheppey, and has flown regularly almost ever since. In 1911 he lent to the Navy three Short oplanes on which the first four officers permitted to fly officially by the Admiralty were taught by Mr. G. B. Cockburn, Mr. McClean himself being then absent on a scientific expedition in the Pacific. Later, Mr. McClean, with Mr. Ogilvie, Mr. Spottiswoode, and the late Mr. Horace Short, made the first seaplane journey up the Nile to Khartoum.

At the beginning of the war, Mr. McClean joined the R.N.A.S., and has done consistently valuable work, both on active service and at home. He has attained the rank of Wing Commander by sheer hard work and merit.

His hosts of friends connected with aeronautics—sailors, soldiers, and civilians alike—will wish him and his bride-to-be every good fortune and happiness.—C. G. C.

##### MARRIAGES.

COMPTON—WRIGHT.—On Jan. 5th, 1918, at St. John's, Bromley, Q.M. J. Geoffrey Compton, R.N.A.S., elder son of Maj. and Mrs. John Compton, of 9, Millfield, Folkestone, was married to Anna Violet, only daughter of Mr. and Mrs. Alfred Wright, Dunsford, Bromley, Kent, by the Rev. Canon P. Barker, Vicar.

PART—PENN.—The marriage took place on Jan. 7th, at Christ Church, Clifton, of Flt. Lt. Gerald M. Part, R.N., youngest son of the late O. E. Part, of Lakeside, Ulveston, Lancs, and Mrs. Part, and Aaita, youngest daughter of R.

Poyer L. Penn and Mrs. Penn, of Camrose, Pembrokeshire. The ceremony was performed by the Rev. Canon W. E. Haigh.

##### BIRTHS.

LAING.—On Jan. 5th, at "St. Kilda," College Road, Hoddesdon, Herts, the wife of Flt. Lt. P. Laing, R.N.—a daughter.

McGAW.—On Jan. 8th, at 5, Station Approach, Sudbury, N.W. (née Marguerite Lilian Perry), the wife of Alexr. J. McGaw, R.N.A.S.—a daughter.

\* \* \*

It was notified officially on Jan. 12th that Vice-Admiral Sir Reginald H. S. Bacon, K.C.B., K.C.V.O., D.S.O., has been appointed by the Minister of Munitions as Controller of the Munitions Inventions Department, in succession to Colonel H. E. F. Goold-Adams, C.B., C.M.G.

[It is to be assumed that as Controller of the M.I.D. Admiral Bacon will have nothing further to do with aeronautics, seeing that the Air Inventions Committee will deal with munitions inventions concerning the air. As Vice-Admiral Commanding Dover Patrol, Admiral Bacon had control over all R.N.A.S. units in the Dunkerque area, and it is generally recognised by all who have been concerned with the R.N.A.S. that, fine as have been the efforts of the naval aviators in that area, their task would have been materially lightened, and their efficiency would have been considerably increased, if they had not been tied to Dover Patrol, as then constituted. It is to be hoped that in future either the R.N.A.S. may be independent of Dover, or that an officer more sympathetic to, and possessing more appreciation of, aircraft may be in command.—C. G. C.]

#### MILITARY.

##### G.H.Q. COMMUNIQUÉS.

JAN. 8th, 9.13 p.m.—On the 7th instant, very little work in the air was possible, owing to thick mist and rain. After dark, there was a short fine interval, during which our machines dropped bombs on Roulers and Courtrai railway stations.

JAN. 10th, 10.3 p.m.—During the morning of the 9th inst. there was great activity in the air. A great deal of artillery work was accomplished, and many photographs were taken. Bombs were dropped on the enemy's billets and hutments, and hostile troops in the trenches were repeatedly attacked with machine-gun fire from a low altitude.

Four hostile machines were brought down in air fighting, and two others were driven down out of control.

Three of our aeroplanes are missing; of these, two were seen to collide during a combat over the enemy's lines.

After 1 p.m. snow fell, rendering flying impossible.

JAN. 11th, 9.19 p.m.—During the 10th instant our aeroplanes carried out a considerable amount of successful artillery work in spite of unfavourable weather.

Ground targets were engaged with machine-gun fire; nearly two tons of bombs were dropped on an ammunition depot in the vicinity of Courtrai and on other targets.

One enemy machine was driven down out of control.

One of our machines is missing.

JAN. 13th, 9.40 p.m.—On the 13th inst. the weather was variable, with a strong westerly wind blowing all day. Our machines made repeated attempts at photography and artillery work, but were in most cases hindered by clouds.

Many bombs were dropped on the enemy's billets and hutments, and several thousands of rounds fired into his trenches.

Two of our aeroplanes are missing.

JAN. 14th, 9.54 p.m.—On the 13th inst. there was a great deal of useful work done in the air, much strenuous fighting taking place.

The fine weather enabled photographic and artillery work to be carried out all day. Bombing and attacks with machine-gun fire from low altitudes were also carried out incessantly, over 400 bombs being dropped on a large ammunition dump near Roulers and on hostile billets, hutments, and railway junctions.

Amongst the targets attacked with machine-gun fire was a party of the enemy engaged in extinguishing a large fire; casualties were caused and the men scattered, and the fire left to burn at will.

In combats, seven hostile machines were brought down, and three others were driven down out of control. Our anti-aircraft fire forced another hostile machine to land intact behind our lines, the pilot being captured.

Three of our machines are missing.

During the night of the 13th-14th inst. our night-flying machines dropped bombs on Roulers and Menin.

All machines returned safely.

On the 14th inst., after a long spell of bad weather, our squadrons carried out a most successful raid into Germany in broad daylight, their objective being the railway station and munitions factories at Karlsruhe, in the Rhine Valley.

One and a quarter tons of bombs were dropped with excellent results, bursts being observed on buildings and sidings of the main railway junction in the centre of the town, on the railway

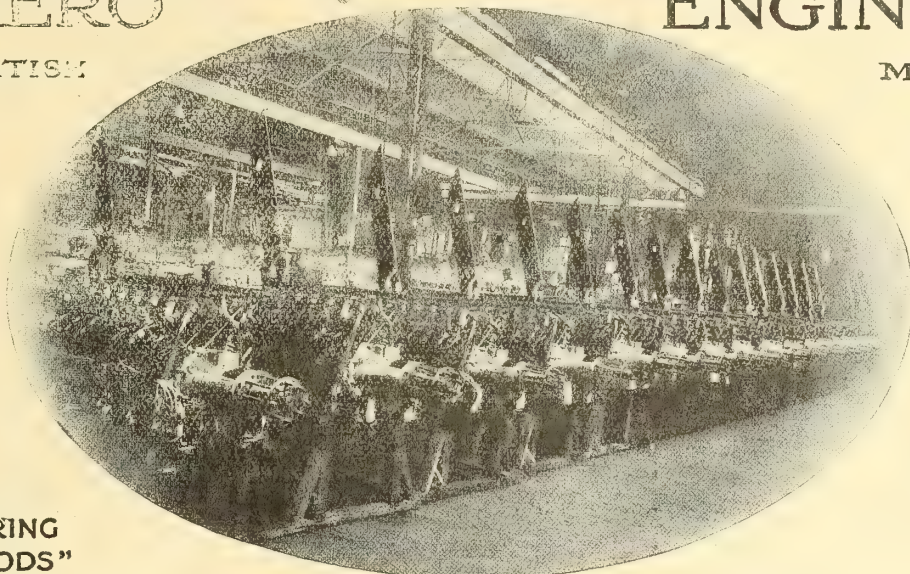



**NAPIER**
**AERO**

BRITISH

**ENGINES**

MADE



"DELIVERING  
THE GOODS"

**D. NAPIER & SON LTD.**

Works:-  
ACTON LONDON W.

**MOTORS**

14 NEW BURLINGTON ST  
LONDON W.



**VARNISHES . . .**  
*for* **AEROPLANES**

(SUBJECT TO A.I.D. INSPECTION)

**AIRSCREWS, SPARS, STRUTS, STAYS, ETC.****ROBT. INGHAM CLARK & CO. LTD.**

Offices: Walter House, Bedford St., Strand, W.C.2.

Telegrams—Pearline, Westrand, London. Telephone—Regent 3923.

Works: West Ham Abbey, London, E.15

Telephone—East 955, 956.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



workshops, and on the smaller junction in the town. Observers report a very large fire was started in the factories alongside the railway; this is confirmed by photographs taken after the raid.

Anti-aircraft fire was very heavy and accurate over the objectives, and several machine attacked the formation without success, as all our aeroplanes reached the objectives, and returned safely.

#### WAR OFFICE COMMUNIQUÉS.

JAN. 8th.—The G.O.C. the British Forces in Italy reports:—During the past week we have destroyed eight enemy machines and driven down two others out of control, losing only one machine ourselves. Several successful raids on enemy aerodromes have been carried out.

JAN. 10th.—The G.O.C. the British Forces in Macedonia reports:—During the past week our aeroplanes have bombed Mirsla (west of Demirhissar) (Struma front) and Tchestovo (north-west of Lake Doiran).

JAN. 10th.—The G.O.C. the British Forces in Mesopotamia reports:—On Jan. 3rd a Turkish aeroplane was brought down by one of our machines and destroyed.

JAN. 11th.—The G.O.C. the British Forces in Italy reports:—Our aeroplanes attacked seven hostile machines yesterday, crashing two and driving down two others out of control.

Our losses nil.

#### THE CASUALTY LIST.

Reported Jan. 9th.  
PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Gordon, Lt. D., Arg. and Sutthd. Highrs., attd. R.F.C.

Heywood, Lt. A. T., R.F.C.  
Oliver, Capt. T. A., R.F.C.  
Wightman, Sec. Lt. J. F., R.F.C.

DIED OF WOUNDS.—Booth, Sec. Lt. W., Rif. Brig., attd. R.F.C.  
DIED.—Matheson, Sec. Lt. H. M., R.F.C.

WOUNDED.—Barnet, Lt. D. G., R.F.A., attd. R.F.C.  
Donovan, Sec. Lt. H. R., R.F.A., attd. R.F.C.  
Horrocks, Sec. Lt. H., R.F.C.

MISSING.—Brydone, Sec. Lt. J., R.F.C.  
McKay, Capt. A. E., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER IN GERMAN HANDS.—Dodds, Lt. A., N. Staff. R., attd. R.F.C.  
AUSTRALIAN FORCE.—WOUNDED.—Macgillicuddy, Lt. A. O., Fl. Corps.

Reported Jan. 10th.  
WOUNDED.—Aitchison, Lt. D. J., R.F.A. and R.F.C.  
Apps, Lt. B. R., R.F.C.  
Bates, Lt. F. A., Yeo. and R.F.C.  
Christie, Sec. Lt. D. M., R.F.C.  
Gibbs, Sec. Lt. H. I. J., R.F.C.  
Woods, Sec. Lt. J. H. M., R.F.C.

MISSING.—Galer, Sec. Lt. H. E., R.F.A., attd. R.F.C.  
PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER IN GERMAN HANDS.—Calvert, Sec. Lt. T. W., R.F.C.

Reported Jan. 12th.  
PREVIOUSLY REPORTED WOUNDED, NOW REPORTED DIED OF WOUNDS.—Bell, Capt. J., R.F.C.

WOUNDED.—Strange, Lt. B., Yeo., attd. R.F.C.  
PREVIOUSLY REPORTED MISSING, NOW REPORTED WOUNDED AND PRISONERS IN GERMAN HANDS.—Edwards, Sec. Lt. G. R., R.F.C.

Fosse, Sec. Lt. E. L., R. War. R., attd. R.F.C.  
Gray, Sec. Lt. G. R., R.F.C.

Reported Jan. 14th.  
DIED OF WOUNDS.—Williamson, Sec. Lt. G. D., R.F.C.  
WOUNDED.—Hobhouse, Lt. R. O., Som. L.I., attd. R.F.C.

MISSING.—Kidd, Sec. Lt. A. L., R.F.C.  
PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER IN GERMAN HANDS.—Marchand, Sec. Lt. E. F., R.F.C.

AUSTRALIAN FORCE.—WOUNDED.—Biddle, Sec. Lt. H. A., Fl. Corps.

Campbell, Lt. J. A., Inf.  
Hill, Lt. E. W., Inf.  
Miller, Lt. P. T., Inf.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER IN GERMAN HANDS.—Ward, Lt. L. N., Fl. Corps.

CANADIAN FORCE.—WOUNDED.—Scott, Lt. L. H., Cent. Ont. R., attd. R.F.C.

MISSING, BELIEVED DROWNED.—Crawley, Lt. W. A., Cent. Ont. Regt., attd. R.F.C.

Reported Jan. 15th.  
KILLED.—Bonyun, Sec. Lt. F. V., R.F.C.

MacNicol, Lt. D. O., R. W. Kent R., attd. R.F.C.  
Spragg, Lt. W. N., R.F.C.

PREVIOUSLY REPORTED WOUNDED, NOW REPORTED DIED OF WOUNDS.—Thomas, Lt. F. W. H., Yeo., attd. R.F.C.

WOUNDED.—Bailes, Lt. W. G. R., R.F.C.  
Baker, Sec. Lt. V. C., Lond. R., attd. R.F.C.  
Upham, Lt. A. C., R.F.C.

MISSING.—Pearson, Lt. C. W., Northd. Fus., attd. R.F.C.  
Pitman, Capt. A. F. E., Sea. High., attd. R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN GERMAN HANDS.—Hammersley, Sec. Lt. F. J. B., Mx. R., attd. R.F.C.

Keller, Lt. C. F., Lond. R., attd. R.F.C.

\* \* \*

#### CASUALTIES AMONG N.C.Os. AND MEN.

THE DATES ARE THOSE OF THE OFFICIAL LIST.

#### DIED OF WOUNDS.

JAN. 4th.—R.F.C.—Morris 106097 Serjt. W. (Witton); Smith 49720 2nd Cl. Air Mech. P. (Thundersley); Streat 9507 1st Cl. Air Mech. R. G. (Finchley, N.).

#### ACCIDENTALLY KILLED.

JAN. 1st.—R.F.C.—Jackson 1163 Serjt. C. (Dronfield).

#### DIED.

JAN. 5th.—R.F.C.—Kelby 48723 1st Cl. Air Mech. J. (Urmston); Kendrew 105995 3rd Cl. Air Mech. J. (York).

#### WOUNDED.

JAN. 1st.—R.F.C.—Love 49438 1st Cl. Air Mech. W. (Leeds).  
JAN. 4th.—Allen 78431 2nd Cl. Air Mech. P. P. (Southampton); Bass 63794 1st Cl. Air Mech. C. T. (East Dulwich, S.E.); Farmer 79014 W. (Cardiff); Farrell 107471 3rd Cl. Air Mech. L. (Halifax); Fitzgerald 7309 Serjt. E. (London, S.E.); Goffe, 66937 2nd Cl. Air Mech. H. J. (Twyford); Poole 9898 2nd Cl. Air Mech. C. S. W. (London, W.C.); Prince 21124 2nd Cl. Air Mech. T. (Bradford); Richards 5020 Cpl. W. (Stanley); Wilson 7643 Cpl. F. E. (Great Yarmouth).  
JAN. 5th.—Gorringe 55964 2nd Cl. Air Mech. S. V. (Leyton, E.).  
R.F.C., attd. R.F.A.—Ward 12263 1st Cl. Air Mech. R. T. (Annerley, S.E.).

#### MISSING.

JAN. 4th.—R.F.C.—Leach 87657 1st Cl. Air Mech. G. (Hyde); Samways 14262 1st Cl. Air Mech. W. (Kingston).

#### AUSTRALIAN IMPERIAL FORCE.

#### KILLED.

JAN. 5th.—A.F.C.—Hughes 559 H.F.

#### PERSONAL NOTICES.

#### DEATHS.

ANDERSON—PERRYMAN.—Lt. William Kaye Anderson, R.F.C., of Ontario, and Sec. Lt. Arthur Charles Perryman, Middlesex Regt., attd. R.F.C., of London, were killed near a Lincolnshire town on Jan. 7th. Their machines came too close together and came into collision owing to mist and snow. Inquiry has shown that both machines were in perfect working order and that no blame attached to anybody.

Mr. Perryman was the only son of Mr. and Mrs. C. H. Perryman, of 5, Alwyne Square, Canonbury. He was educated at the Mercers' School, and joined the A.S.C., M.T., in August, 1914. He obtained his commission in the Middlesex Regt. in 1916, and volunteered for the R.F.C. the same year. He was in the retreat from Mons and the second battle for Thiepval. All his service was at the front. He was 29 years of age.



BOOTH.—Lt. William Booth, Rifle Brigade, attd. R.F.C., who died on Dec. 28th from wounds received in air fighting, was the younger son of Mr. W. H. Booth (borough treasurer of St. Pancras) and Mrs. Booth, of 81, Dartmouth Park Road, Highgate, formerly of Heywood, Lancs. He was educated at Owen's School, Islington, and Worksop College, Notts, and joined the staff of the London and South-Western Bank in 1913. He enlisted in the Queen's Westminsters in May, 1915, received a commission in the Rifle Brigade in June, 1916, proceeded to France six months later, and took part in the active operations in the Arras sector. In August, 1917, he became attached to the R.F.C. as an observer, joining a squadron in France in September last.

CALVERLEY.—Lt. Geoffrey Walter Calverley, D.S.O., Royal Irish Rifles and R.F.C., who died on Jan. 7th, from the results of an aeroplane accident, was 22 years of age, and son of the late Walter Calverley. He entered the Royal Irish Rifles in Oct., 1914, and was promoted in March, 1915. Transferring to the Royal Flying Corps, he received his "wings" in June last year.

FEDDEN.—An inquest was held at a town on the South-East Coast on Jan. 10th on Lt. Cecil Olcher Fedden, Indian Infantry, attached R.F.C., whose death was announced last week. Lt. J. S. Hodges, R.F.C., who saw Mr. Fedden in danger of drowning, brought his machine down close to the water, and dived in. He held Mr. Fedden up for nearly three-quarters of an hour, till they were got out of the water, locked in each other's arms, by the captain of a lifeboat who went off to the rescue in a small boat. Mr. Hodges revived, but Mr. Fedden succumbed. The jury expressed the opinion a boat should be in readiness when aeroplanes were practising over water. They commended the lifeboat captain, who had previously rescued an officer and a mechanic in like circumstances.

FENNELLY.—Lt. James Phelps Fennelly, R.F.C., who was killed on Dec. 24th, 1917, in a collision in the air at the height



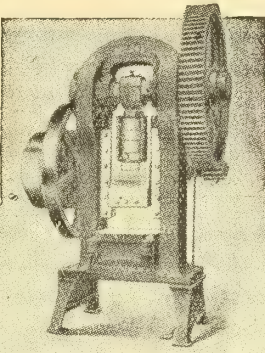
# BLISS

## PRESSES & DIES

FOR

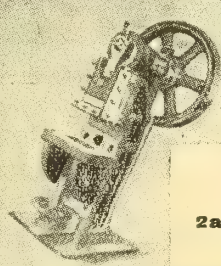
AEROPLANE

SEND YOUR  
STAMPING  
PROPOSITIONS  
TO US.



STAMPINGS

WE CAN DESIGN  
THE DIES  
AND RECOMMEND  
SUITABLE PRESSES.

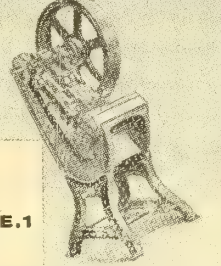


WRITE TO

E. W. BLISS CO.,

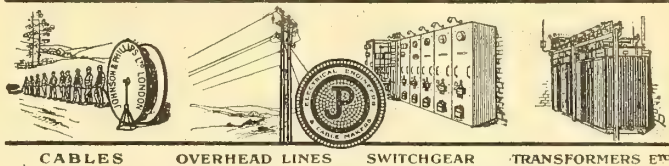
2a POCKOCK STREET, BLACKFRIARS RD., LONDON, S.E.1

TELEPHONE: HOP 4340.    TELEGRAMS: "BLISSDON, LONDON."





SPECIALISTS IN ELECTRICAL TRANSMISSION AND DISTRIBUTION



CABLES    OVERHEAD LINES    SWITCHGEAR    TRANSFORMERS ETC

*The Illustration shows a section of  
a 20,000 volt three-phase overhead*

## ELECTRIC POWER TRANSMISSION LINE

*lately completed by us for an outlying  
Government Mine.*

*The cheapest method of delivering power  
to Works, etc., in country districts.*

12, UNION COURT, OLD BROAD ST., LONDON, E.C. 2.

Telegrams  
"JUNO"  
LONDON

**JOHNSON AND PHILLIPS LTD**  
ELECTRICAL ENGINEERS & CABLE MAKERS  
**CHARLTON, LONDON, S.E. 7.**

Telephone  
400  
GREENWICH

BIRMINGHAM    CARDIFF    GLASGOW    MANCHESTER    NEWCASTLE-ON-TYNE    PORTSMOUTH  
206, Corporation St.    9, Park Place,    159, W. George St.    231, Deansgate    44b, Blackett St.    Cleveland Rd. Gosport

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



of 15,000 ft., was the youngest son of Mr. and Mrs. Fennelly, 60, Dresden Road, Highgate. He was 22 years of age.

**McDOWALL.**—Sec. Lt. A. McDowall, E. Lanc. R., att'd. R.F.C., who was accidentally killed in England on Jan. 12th, was the only son of Mr. and Mrs. G. A. McDowall, of Loughton, Essex.

**MEDLEN.**—Lt. Leslie L. Medlen, R.F.C., who was killed on Dec. 22nd, was the second son of Mr. and Mrs. C. H. Medlen, Kent House, Eglinton Hill, Plumstead, and was born and educated in Woolwich. He was a pupil at Eglinton Road Council School, and at Bloomfield Road Central School, from which he passed second in the trade lads' examination at the Royal Arsenal. After passing through the engineering shops of the Royal Gun Factories he entered the metallurgical department, and later became an assistant metallurgist. He joined the R.F.C. in June, 1917, and went to the front in Oct.

**NICKSON.**—Lt. John Reginald Nickson, R.F.C., who was accidentally killed while flying on Jan. 2nd, was the second son of the late J. J. and Mrs. Nickson, of Vancouver, Canada. He enlisted as a private in August, 1914, and after serving for two years abroad with the Canadian Mounted Rifles, he was granted his commission in the Royal Flying Corps, and had recently qualified as a pilot. Mr. Nickson has lived in British Columbia nearly all his life, and was well known throughout the whole province. He was 26 years of age.

**REEDER.**—Capt. Robert Reeder, Manch. R., att'd. R.F.C., who was killed in action on Jan. 6th, was the eldest son of Lt. and Mrs. R. J. Reeder, 19a, Emmanuel Road, Balham, S.W., and husband of Mrs. M. Reeder, 13, Deburgh Street, Dover. He was 25 years of age.

**STACEY.**—Sec. Lt. John Harold Stacey, R.F.C., who was killed in action on Dec. 4th, was the second son of Mr. and Mrs. E. L. Stacey, Clovelly, Merstham. Mr. Stacey served at Suvla Bay in 1915, and was severely wounded on the Somme in 1916. He was 22 years of age.

**TATHAM.**—Sec. Lt. Lawrence Castell Stanley Tatham, R.F.C., B.A., Trinity College, Cambridge, who was killed in action on Jan. 11th, was the second surviving son of the late Stanley Tatham, of Branksome Park, Bournemouth, and of Frances Emma Constance Tatham, at 2, St. George's Court, Gloucester Road, S.W. He was 22 years of age.

**WARREN.**—Arnold John Warren, who was the only son of Arnold and Mary Warren, of Enfield, was killed in an aeroplane accident on Jan. 4th.

**WILCOX.**—Sec. Lt. Percy William Wilcox, R.F.C., who was killed whilst flying on Dec. 31st, 1917, was the youngest son of Joseph John Wilcox, of Brighton.

**WILLIAMSON.**—Lt. Gerald Douglas Williamson, R.F.C., who died of wounds received in action on Jan. 1st, was the second son of Mr. and Mrs. Williamson, of Whitbred's, Hockley, Essex. He was 19 years of age.

**WISE and PAYNE.**—Lt. Wise, R.F.C., and Lt. Payne, R.F.C., were starting on a flight at the Hendon Aerodrome on Jan. 13th, when the machine caught fire, and both officers received burns from which they died.

#### ENGAGEMENTS.

**BURD-LANGRAN.**—An engagement is announced between Capt. John Marsh Burd, M.C., R.F.A., att'd. R.F.C., only son of Dr. and Mrs. Burd, of Okehampton, Devon, and Miss Norah Mary Langran, third daughter of Dr. and Mrs. Langran, of The Lawn, Axminster.

**SANCTUARY-PARSONS.**—The marriage between Capt. Campbell T. Sanctuary, R.F.A., att'd. R.F.C., and Miss E. Barbara Parsons will take place at Misterton, Somerset, on Feb. 6th. No invitations will be sent, but all friends will be welcome at the church.

#### MARRIAGES.

**DOUGLAS-HORBURY.**—On Jan. 5th, at St. John's, Great Sutton, Lt. Percy Douglas, R.F.C., eldest son of the Rev. Percy and Mrs. Douglas, of Great Sutton, was married to Edith, youngest daughter of Mr. and Mrs. W. H. Horbury, of Greenfields, Little Sutton, Cheshire, by the Rev. Percy Douglas, father of the bridegroom, assisted by the Rev. A. E. Cooper, M.A., Vicar of Hooton.

**GREY-DOWNES.**—On Jan. 10th, at Batheaston Church, Bath, Sec. Lt. Trevlyn Grey, A.F.C., son of the late Albert Grey, of Kempsey, N.S.W., was married to Katharine, younger daughter of Rev. A. Downes, Vicar of Batheaston, by the Rev. H. Downes, assisted by the Rev. R. Selwyn.

**MICHELL CLARKE-NEILL.**—On Jan. 12th, at St. Mary Abbot's, Kensington, Capt. A. J. Michell Clarke, M.C., Glouc. Regt., att'd. R.F.C., son of Dr. and Mrs. Michell Clarke, of Clifton, Bristol, was married to Eileen, only daughter of Mr. and Mrs. Harold Neill, of 22, Eldon Road, W., by the Vicar and the Rev. E. Marling Roberts.

**PULLEN-BORRETT.**—On Jan. 5th, at All Saints Church, Reading, Lt. Walter Harris Pullen, R.F.C., elder son of Mr.

George Pullen, of Belmont, Reading, was married to Constance Ivy, youngest daughter of Maj.-Gen. Herbert C. Borrett, C.B., and Mrs. Herbert Borrett, of Lancaster Lodge, Reading, by the Rev. C. R. Durham, assisted by the Rev. W. J. Holloway, Priest-in-Charge.

**SMITH [CARINGTON]-FULLER.**—On Jan. 5th, at St. Matthew's, Bayswater, Capt. Charles Molyneux Smith, M.C., R.F.C., eldest son of Mr. and Mrs. Arthur Smith, of Glenavon, Bedford, was married to Barbara, widow of Capt. W. B. Fuller, The Queen's Regt., and daughter of Maj. and Mrs. S. A. Pixley, of Maybury Knowle, Woking. Capt. and Mrs. Smith immediately after their wedding adopted the name of Carington, by which name they will be known in future.

**WHITFIELD-GROSS.**—On Jan. 10th, at St. Matthew's, Bayswater, Capt. F. E. B. Whitfield, Welsh Regt. and R.F.C., son of the Rev. Whitfield, Vicar of Carleon, was married to Nora Beatrice Gross, daughter of Philip C. Gross, 26, Leinster Sq., W.

#### BIRTHS.

**GREEN.**—On Dec. 28th, 1917, at Hainault Farm, Essex, the wife of Capt. G. W. Murlis Green, D.S.O., M.C., R.F.C., of a son, prematurely.

**HICKS.**—On Jan. 7th, at Saltburn, to the wife of Capt. Lionel Hicks, R.F.C.—a daughter.

**JOY.**—On Jan. 12th, at Quarry Down, Hythe, the wife of Major Douglas Joy, R.F.C., of a daughter.

**SCANDRETT.**—On Jan. 8th, at 78, Durlston Road, Kingston-on-Thames, to the wife of Lt. H. Scandrett, R.F.C.—a son.

Sec. Lt. A. G. Grose, Gen. List and R.F.C., and Lt. B. C. H. Grimwood, M.C., R.F.C., were reported missing on Nov. 7th, 1917. Mrs. J. C. Grose, of The Limes, Weedon Road, Northampton, will be glad if the relatives of any officers and men who are prisoners of war in Germany will make inquiries as to their fate.

Capt. F. H. B. Selous, M.C., R.F.C., was reported missing on Jan. 4th. If relatives of prisoners of war in Germany will kindly ask news of him, the same will be gratefully received by Mrs. Selous, Heatherside, Worplesdon, Surrey.

Sec. Lt. G. G. E. Smithett, R.F.C., was reported missing on Oct. 12th. If any officer or man can give any information, or if relatives of prisoners of war in Germany would ask for news same would be gratefully received by Mr. Smithett, 4, The Elms, Sunderland.

Lt. A. N. Westlake, M.C., R.F.C., was reported missing on Jan. 4th. If any relatives of prisoners of war in Germany will kindly ask news of him, the same will be gratefully received by Mrs. Westlake, of Wayside, Wareham, Dorset.

#### FRANCE

##### OFFICIAL COMMUNIQUÉS.

JAN. 8th.—On Jan. 6th in the daytime our pilots brought down or seriously damaged six enemy aeroplanes.

Our bombing squadrons carried out several operations during the night of Jan. 5th and 6th. The aniline works of Ludwigs-hafen, the railway station of Freiburg-Breisgau, the aviation ground of Neubreisach, the factories of Rombach, Maizières, and Hagondange were bombarded with many projectiles.

During the month of Dec., 1917, the activity of our chasing aeroplanes was particularly successful. Our pilots, in spite of the intense cold and unfavourable atmospheric conditions, did not cease to seek combat over the German lines, and maintained their superiority in a brilliant manner.

Seventy-six German aeroplanes were destroyed or put out of action. Of this number 28 machines were brought down in the French lines, 18 were seen to crash to the ground in German territory, and, in addition, 35 other German aeroplanes appear to have been destroyed, but this has not been confirmed, as the inquiry could not be entirely conclusive.

Our losses in the month of December are as follows:—Seven French aeroplanes shot down or lost in the German lines, three shot down in the French lines, nine damaged by the enemy had to land in our lines; lastly, one of our captive balloons was burnt, making a total of 20 French machines, against 76 German aeroplanes.

**ARMY OF THE ORIENT.**—Allied aviators executed a number of bombardments in the Vardar Valley and to the north of Monastir.

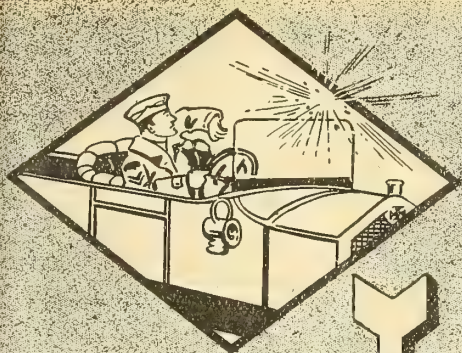
JAN. 11th.—During the day of Jan. 9th two German aeroplanes were brought down in aerial combat.

**ARMY OF THE ORIENT.**—British aviators bombarded enemy cantonments in the region of Demirhissar (Struma front).

JAN. 12th.—Between Jan. 1st and Jan. 10th our pilots brought down 15 German aeroplanes and one captive balloon. Sub-Lt. Madon achieved his 20th victory.

In addition, our pilots brought down in the enemy lines 12 other machines, the destruction of which, although very probable, cannot be confirmed.





An Auster TRIPLEX Windscreen on a Crossley Car attached to the Royal Flying Corps. A shrapnel shell exploded fairly close to the car, and it will be noticed that the glass in question was struck by eight shrapnel bullets, and yet only one penetrated the glass, and that one only just got through. The glass is still perfectly rigid and strong, airtight and watertight, and, except for one small hole, sufficiently strong to continue its work for an indefinite period.



# 'TRIPLEX'

## THE ONLY SAFETY GLASS

It is Essential for  
Goggles,  
Windscreens,  
Windows, etc.

Send for Literature  
Mailed Post Free.

The Triplex Safety Glass  
Co., Ltd.,

1 Albemarle St., London, W.1.

Telephone: Regent 1840.  
Telegrams: Shatterlys, Piccy, London

CONTRACTORS TO  
H.M. GOVERNMENT

# HAIGHS

(OLDHAM) LIMITED

MANUFACTURERS OF ALL KINDS OF MACHINE TOOLS

NEW MACHINE TOOLS FOR EARLY DELIVERY.

Subject to prior orders and Ministry's permit, we are in a position to offer the following machine tools:—

### DELIVERY FROM STOCK.

- One 5in. centre S.S. & S.C. Engine Lathe, 5ft. 9in. gap bed.
- Three 5in. centre S.S. & S.C. Lathes, gap bed 5ft. long. Machine arranged with Treble Gear.
- One 12½in. centre S.S. & S.C. Engine Lathe, 12ft. 3in. straight bed.
- Six 10½in. centre S.S. & S.C. Engine Lathes, 8ft. 3in. straight bed. Fast headstock front bearing 3½in. diameter.

(We can also offer 14 more of these machines for delivery within 5 to 6 weeks.)

Twelve 9½in. centre heavy duty Combination Shell Turning Lathes, for 6in. shells

### DELIVERY IN FOUR TO FIVE WEEKS.

- Two 42in. diameter Treble Geared Boring & Facing Lathes, complete with chuck
- Ten 10½in. centre S.S. & S.C. Engine Lathes, with 10ft. 3in. gap bed.
- Ten 8½in. centre S.S. & S.C. Engine Lathes, with 8ft. 3in. gap bed.
- One 8½in. centre S.S. & S.C. Engine Lathe, with 10ft. 3in. gap bed.
- Twelve 10½in. centre S.S. & S.C. Engine Lathes, 8ft. 3in. straight bed. Fast headstock front bearing 5in. diameter.

### DELIVERY IN EIGHT WEEKS.

- One 10½in. centre S.S. & S.C. Engine Lathe, with gap bed 26ft. long.

Further particulars with specification and prices on application.

Telegrams—HAIGH, OLDHAM.  
Telephone—1273 OLDHAM.



Globe Iron Works, OLDHAM.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



ARMY OF THE ORIENT.—Our aviators bombarded enemy camps and concentrations north-east of Doiran and in the region of Monastir.

JAN. 13th.—ARMY OF THE ORIENT.—The railway station of Tchestovo (north-west of Lake Doiran) has been bombed by British aviators.

JAN. 14th.—ARMY OF THE ORIENT.—Allied aviators successfully dropped bombs on the railway from Seres to Drama and on enemy establishments in the regions of Demirhissar and Allghar (north of Vetrenik).

### GERMANY.

#### OFFICIAL COMMUNIQUÉS.

JAN. 10th.—In December the enemy losses in aircraft on the German front amounted to nine captive balloons and 119 aeroplanes, of which 47 came down behind our lines. The rest were observed to fall behind the enemy's positions.

We have lost in battle 82 aeroplanes and two captive balloons.

JAN. 13th.—In numerous aerial encounters yesterday (Saturday) six enemy aeroplanes and three captive balloons were shot down.

\* \* \*

A Berlin telegram (says a Reuter's message from Amsterdam on Jan. 13th) states that during December 13 enemy air attacks took place in the German homeland, six of which were on the industrial districts of Lorraine and Luxemburg, and seven on Freiburg and other towns—namely, Baden, Mannheim, Saarbrücken, and Zweibrücken. With the exception of one interruption of work at some ironworks caused by the gas supplies being hit, it is stated that the results of the attacks were insignificant, and the damage to private property was very small. Altogether seven persons were killed and 31 injured, among them being some French prisoners of war. One enemy aeroplane was shot down over the German homeland beyond the lines.

\* \* \*

It is reported from Munich (via Amsterdam, Jan. 14th) that the Bavarian Flt. Lt. Von Müller, who had thirty-eight victories to his credit, has been killed as the result of an accident in the air.

### ITALY.

#### OFFICIAL COMMUNIQUÉS.

JAN. 11th.—During the day atmospheric conditions were favourable to aerial activity. Three enemy machines, for one of which British aviators accounted, were brought down.

JAN. 12th.—Four enemy aeroplanes were brought down by British aviators. A fifth machine hit by our aviators fell in flames near Lusiana (Asiago Plateau). Our machines bombarded with visible results military establishments in Sugana Valley (Upper Brenta).

JAN. 13th.—Magazines and encampments were effectively bombarded with 1,600 kilos. (about a ton and a half) of projectiles by our machines.

A bold reconnaissance was carried out by seaplanes on the Livenza. Our aviators brought down two enemy machines at Camposampiero and to the south-east of Asiago. British aviators accounted for a third machine in Seren Valley (north of Mt. Grappa).

\* \* \*

The following semi-official communiqué was issued in Rome on Jan. 9th:—

"On the morning of Jan. 6th one of our seaplane squadrons effectively bombarded the military works at Lissa, one of the Southern Dalmatian Islands, and the huge warehouses on the quays in the harbour. In spite of a heavy squall all our machines returned to their base."

### TURKEY.

#### OFFICIAL COMMUNIQUÉ.

JAN. 5th.—PALESTINE FRONT.—A fleet of aeroplanes, composed of from 12 to 14 machines, attacked one of our hangars. As a result of our land and air defensive measures two enemy machines were brought down. Of the occupants three were dead and a fourth seriously wounded. Our hangar was in no way damaged.

Forty bombs were dropped by our aeroplanes on enemy works. Numerous successful hits were observed. In spite of a violent reply all our machines returned safely.

### BELGIUM.

#### OFFICIAL COMMUNIQUÉ.

JAN. 13th.—Our aviators, taking advantage of the fine weather, to-day carried out 47 flights, 21 of which were by chaser planes.

\* \* \*

*Les Nouvelles* reports that on Jan. 10th last a number of Allied aeroplanes flew over large areas of occupied Belgium and dropped copies of President Wilson's famous speech to Congress. At Liège thousands of these copies were picked up

### HOLLAND.

The "Handelsblad" (Amsterdam) reports that on Jan. 6th an aeroplane flying the Allied colours and armed with two machine

guns descended near Brielle (South Holland). The occupant was Sec. Lt. of Reserve Shames, of Kitchener (formerly Berlin), Canada. He had ascended that morning, but had lost his way in the clouds.

He evidently thought he was descending on French territory, as he had still some petrol left. He was taken last night to the Hague and the machine was dismantled.

### U.S.A.

A Reuter's message from Washington, dated Jan. 10th, says that in Mr. Baker's statement made to the Senate's War Investigating Committee on the American Army Preparations, he said that the aviation section on April 1st, 1917, consisted of 95 officers and 1,120 men. On January 1st, 1918, it consisted of 3,900 officers and 82,120 men.

## ON A PURELY PERSONAL MATTER: WITH APOLOGIES TO "AEROPLANE" READERS.

One of the sorrows of my life is that I seldom have time to read that excellent paper, "The Autocar," of whose attractions not the least entertaining are the verbal antics of that funny fellow who signs himself "Owen John," a writer whose name suggests a Welsh origin, and whose place in the scheme of that otherwise decorous journal seems to be that of the Court Fool of earlier days. Therefore, I am the more beholden to various friends who have brought to my notice an article by Mr. John which is devoted chiefly to my humble self, and to a recent article of mine concerning the antiquated city of Coventry, its aborigines, its strike, and its probable and deserved rewards for the said strike.

I use the word "chiefly" advisedly, for it has seemed good to the "Autocar's" Court Fool to import into the discussion one to whom allusion would have been omitted if due attention had been paid to the canons of good form. In newspaper controversy, as in arguments in the better kind of club, mess, or ward-room, personal abuse is admissible, and frequently entertaining, as is scathing comment on business or Service antecedents. Even national, racial, or ancestral peculiarities may be fair game. But allusions to the domestic affairs of one's opponent are usually considered as being out of court. I am indebted to Mr. Witherby for pointing this out to Mr. John, and

Telegraphic Address: POETRY, 'PHONE LONDON.  
Telephones: AVENUE 995, 996, 7986.

(Partners:  
H. W. PRITT,  
W. G. PRITT,  
P. W. SMALLWOOD,  
E. R. HILL),

# PRITT & CO.

METAL WAREHOUSEMEN, MUNITION  
AND AERONAUTICAL CONTRACTORS

46, FENCHURCH STREET,  
LONDON, E.C. 3,

Where all communications must be addressed.

CITY WAREHOUSES: 62a, Vine Street, Minories, E.  
9, Jewry Street, Aldgate, E.C.  
DEPOTS: Paddington, Poplar, Shoreditch.

We hold good stocks, complying with Air Board, R.A.F.  
and Admiralty Specifications, of the following:

BRASS & COPPER in sheets, tubes, rod, wire, etc.  
TINNED STEEL SHEETS.  
MILD STEEL SHEETS, 9a.  
BRIGHT DRAWN MILD STEEL BARS, 3a.  
A. G. S. BOLTS, NUTS AND WASHERS.  
COPPER RIVETS. TINMAN'S SOLDER.  
SOLDERING IRONS.  
BEST SWEDISH WELDING WIRE.  
BRAZING SOLDER in wire and granulated form.  
SILVER SOLDER. WIRE GAUZE, &c.

All material passed A.I.D. before despatch.

DAILY DELIVERIES made by our own vans within a radius of  
15 miles of our Warehouses.

NOTE.—All orders for Aeronautical Work receive especially  
prompt attention.

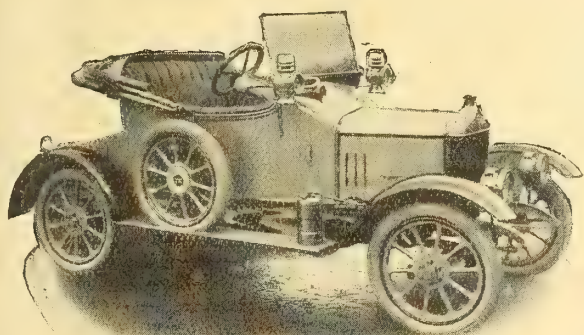
WE ARE BUYERS OF SCRAP BRASS & COPPER.



**Economy in Motoring**  
is represented by just how far your requirements are met by the type of machine you purchase. Study for yourself the advantages offered in the

**'STANDARD'**

Light Car and bear these in mind when we are able to resume deliveries. :: ::



**THE STANDARD MOTOR CO. LTD.**  
**COVENTRY**

London Agents: The Pritchley Autocar Co. Ltd. 216, Gr. Portland St. W.

G. 9

## MOSS- AERO-ENGINE GEARING

Manufactured  
on principles ensuring  
greatest

**STRENGTH  
AND  
ACCURACY.**



**GEARING FLYWHEELS CAMSHAFTS**  
**R.A.F. PROPELLER BOSSES.**

Our Aero. parts are made in specially **HIGH TENSILE STEEL**, heat treated and all parts corrected for distortion.

**TRANSPORT, LORRY & PLEASURE CAR GEARING**

Bevel and Worm Drives accurately generated. Steering Worms and Sectors. Spur and Bevel Differentials. Gear Box Gears. Camshafts with guaranteed Glass-hard Cam Profiles.

## -GEARING

**THE MOSS GEAR CO., LTD.,**

W. DUCKITT

Managing Director **Thomas St., Aston, BIRMINGHAM**

# Bowden, Tyseley.



for  
**BOWDEN  
CONTROLS**  
and  
**BOWDEN CABLES**  
for all  
**AEROPLANE  
PURPOSES.**

Quotations on application.

Note Address—

**BOWDEN BRAKE  
Co., Ltd., Tyseley,  
B'HAM.**

R.H.S.

**Of Special  
Interest to  
Government  
Contractors.**

Not Mill Furnishing  
— or Hydraulic. —

## J. B. BROOKS & Co., Ltd.

(Contractors to the Admiralty & War Office,  
Air Board, Ministry of Munitions, etc.),

and the Leather Specialists  
with the Largest Works, Finest  
Equipment, Best Facilities and  
Widest Experience in the Trade

invite enquiries for  
**Articles, Parts, Fitments  
and Cases of**

## LEATHER

Address—

**J. B. BROOKS & CO., LTD.,**  
**104 Criterion Works.**  
**BIRMINGHAM**

1069

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



to the Editor of "The Autocar" for publishing Mr. Witherby's letter.

However, as Mr. John has seen fit to introduce such matter into the discussion, I would merely indicate to him that though I owe my domestic happiness to Coventry, I fail to see how Coventry has thereby deserved to be treated as a holy city. Mr. John's knowledge of history will doubtless recall to him that the wise men came out of the East. Similarly, wise people of either sex may come out of Coventry, and stop out. Further, I would commend to Mr. John's consideration that if one is so fortunate as to find a solitary pearl in a barrel of bad oysters the fact seems an inadequate reason for having the barrel mounted in gold and preserved as a family heirloom. Coventry's loss has been my gain, and Coventry is the poorer thereby.

Under ordinary circumstances one would not have referred to this purely personal affair at all, but one can hardly ignore any utterance in so important a paper as "The Autocar," especially as it is read by practically all readers of THE AEROPLANE. Possibly such an extraordinary lapse from good taste may be explained by the interesting historical fact—legend and fact are difficult to disentangle in history books—that the last surviving Welsh gentleman expired somewhere in the fourteenth century, having had the honour of being slain by a Norman knight, or the luck of being pole-axed by a Saxon man-at-arms. And, apparently, even cases of atavism are infrequent in the surviving remnants of the ancient British race.

Let us now turn to the admissible portion of Mr. John's article. We have, at any rate, his admission that he does not read THE AEROPLANE, which accounts for some of his fallacious arguments. In the first place, if he did read it, he would know that this paper merely reflects the views of the people who know, and that I cannot claim ever to have had an original idea or a purely personal opinion on anything. That is why the views expressed in this paper have been almost always correct. It is not a spring of opinions, it is merely a reservoir. So he need never fear being afflicted with "the opinions of any one man."

Mr. John is pleased to refer to what he calls an attack on a deceased aviator which once appeared in this paper. In that particular instance nothing but plain facts were stated, and those same facts had been stated previously, months before the death of the said aviator. No opinions were expressed, no reflections were made on the deceased, and any inferential attack applied entirely to those who had placed the dead man in a false position.

In regard to Coventry, I defy Mr. John to controvert my statements. Indeed, he makes no attempt to do so, relying on the classic steps of the ward-room argument—unsupported statement, flat contradiction, and personal abuse. He distorts my statement that Coventry's various new industries have been started by "foreigners" and allowed to lapse by Coventry itself, into a statement that "Coventry has several times led the world in new manufactures," and "is decadent because her example is followed everywhere else." One would recall that in at least one instance—the cycle trade—the new trade was imported because the workers of Coventry were starving because they had lost their former trades through sheer stupidity.

As regards Coventry's "sloth and lust"—to quote Mr. John—he admits that he does not go there twice a year. For my sins, I lived there for nearly four years, so probably I know the place rather better than he does. The absence of what an American would call a "red-light district" is no proof of abounding virtue, any more than Coventry's plethora of churches and chapels is a proof of its holiness. "The nearer the Church the farther from God" is a very sound proverb, and the absence of red lights means the greater danger. As regards its churches of the older sort, Mr. John apparently forgets that most mediæval churches were built not so much from disinterested piety as by way of repentance for sins, being, in fact, a species of fire insurance. On which reasoning the more churches a place can show the more wicked it must have been.

Mr. John's reference to that much-maligned person "Peeping Tom" seems unfortunate. Presumably Mr. John would have had us all hide our faces hypocritically from Coventry's naked shame, and pretend that no strike ever existed, just as Coventry of the legend hid its face lest it should see the truth about Lady Godiva. Anyhow, if Peeping Tom were born and bred in Coventry, doubtless he was "compact of thankless earth," and so that insufferable prig Tennyson was perhaps right, for once.

Next, Mr. John suggests that I attacked Coventry because there are hardly any Coventry advertisements in THE AEROPLANE. I confess that I am amazed at such an innuendo coming from one who, if not a member of the staff, is at least a regular contributor to the "Autocar." Having myself sat at the feet of the editor of that august paper, I imbibed thoroughly long ago the doctrine of not letting the advertisement department know what the editorial department doeth—and vice versa. In this particular instance, at any rate, I can honestly claim that I did not stop

## SALMSON AERO-ENGINES

(Canton-Unné System).

All enquiries should be addressed to  
**THE DUDBRIDGE IRON WORKS,  
LIMITED,  
87, Victoria Street, London, S.W. 1.**

Telegrams .. .. Aeroflight, Vic. London.  
Telephone .. .. 7026 Victoria.

## The Submarine.

"SONGS OF THE SUBMARINE."

By Klaxon. 2/- net, 2/3 post free.

"Klaxon is decidedly a poet to be cultivated."—*Aeroplane*.

## The Flying Man.

"BALLADS OF THE FLYING  
CORPS." By G. R. Samways, R.F.C.  
2/6 net, 2/9 post free.

"Gives one an insight into the R.F.C. little known."—*Aeroplane*

Order of your bookseller or direct from—

McBRIDE, NAST & Co., 2, Brems Buildings, E.C.

# OFFICIAL ACCEPTANCE TESTS

## LAND MACHINES.

S.P.A.D.	Avro
Sopwith	Armstrong-
B.E.	Whitworth
Short	D. H. 4.
Curtiss	Handley-Page
Mann, Egerton	Bristol
M. Farman	Vickers
H. Farman	Nieuport
Morane	Supermarine, &c.

## SEAPLANES.

Short, Sopwith, America Boats, F.B.A.  
Boats, Curtiss Boats, Norman-Thompson,  
A. D. Boats, &c.

*Private Aerodromes  
Surveyed and Pilots'  
Reports Furnished.*

## DELIVERY AND EXPERIMENTAL FLIGHTS ON LAND MACHINES & SEAPLANES.

COMPLETE REPORTS FURNISHED.

Rates on application to

## THE PRODGER - ISAAC

AVIATION COMPANY  
(C. B. Prodger and Bernard Isaac),  
166, Piccadilly, London, W.1.

Telephone: Gerrard 278 (2 lines.)

Telegrams: "Aeromina, Piccy, London."

## CLIFFORD B. PRODGER

J. LANKESTER-PARKER,  
and other Pilots.

Approved Admiralty Pilots  
—for Acceptance Trials.—

## INSURANCE.

WE are now in a position to quote low rates, through our brokers at Lloyd's, for the Insurance of Aircraft during ACCEPTANCE TRIALS AND DELIVERY FLIGHTS with an excellent and most comprehensive Policy. May we quote you for your new contracts?

**SPECIAL ARRANGEMENTS with Sub-Contractors for HANDLEY-PAGE Type Land Machines of "AMERICA" Type Flying Boats**



# W. Alldays

## "EMPIRE" GAS FIRED BRAZING TABLE

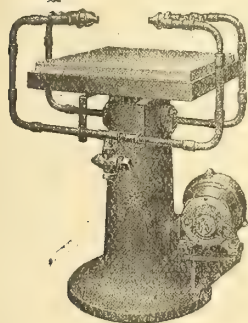
For use in the construction of Aeroplanes.

This Table is so arranged that a centre flame is obtained which is specially useful for local heating, Brazing, etc.

For all particulars write to

Sole Makers  
**Alldays & Onions Co. Ltd.**  
**BIRMINGHAM**

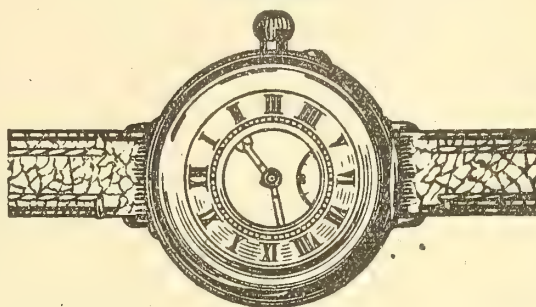
And at  
58, Holborn Viaduct,  
LONDON, E.C.1.



JEWELLERS



SILVERSMITHS



Patent No. 11876/15.

## THE "MILITARY" LUMINOUS WATCH.

A THOROUGHLY reliable and practical luminous watch, indispensable for Naval or Military Service. The "Military" Luminous Watch is the only Screw Case Silver Watch fitted with a "hunter" cover, and is the exclusive patent of The Goldsmiths and Silversmiths Company, Ltd.

As illustrated.

£4 12 6

Without Cover.

£3 15 0

THE  
**GOLDSMITHS & SILVERSMITHS  
COMPANY LTD.** with which is incorporated The Goldsmiths' Alliance Ltd. Established 1731

Only one Address (no branches):

112, REGENT STREET, LONDON, W.

## AIRCRAFT DEPARTMENT

THE WORLD'S LARGEST MANUFACTURERS OF ALL KINDS OF ENGRAVED METAL GOODS.

**British Metal (Kingston) Ltd.**

*The Factory*

Kingston-on-Thames

**DIALS & INSTRUCTION PLATES**  
MADE IN ANY METALS,  
IVORY, IVOROID, BONE, ETC.  
ANY QUANTITIES, WORDING, DESIGN,  
SIZE, SHAPE OR COLOURS.

**COMPLETE SHEET METAL  
AIRCRAFT COMPONENTS**

RIVETED, SWEATED, BRAZED OR WELDED.

R.E.8, F.E.2B.&D, B.E.2C-D-E,  
SE5, De H6.

RESIDENT A.I.D. EXAMINER.

# AEROPLANE PARTS

Our 20 years experience in making Rims and Tubular Parts for Cycles, Motor Cycles, etc., is now being utilised in the production of

**AEROPLANE PARTS**

and, as in the past, we aim at producing only the highest grade goods, which can always be depended upon to give complete satisfaction. We specialise in

**RIMS for AIRCRAFT. TUBES and TUBULAR CONSTRUCTION. SHEET METAL PRESSED PARTS** of every description.

**SPECIAL SECTIONS in STEEL** of any length, gauge or width.

**BRAZING, ACETYLENE and ELECTRIC WELDING, etc.**

and can make any special parts to instruction. Send us your enquiries

THE  
**LOMBARD**

Rim & Tube Co.,  
Lombard Street  
BIRMINGHAM.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



to consider the effect on the manufacturers of Coventry of my remarks on their employees, and, in any case, the task of running this paper with one solitary editorial assistant leaves me little time for studying the advertisement pages.

Nevertheless, it may interest Mr. John to know that my attack so moved one famous Coventry firm that it wrote asking for a colossal number of copies of the offensive issue for distribution to its disloyal employees. It was with regret that I had to reply that this issue was, as usual, sold out, and the type melted down for further use. However, one can quite understand the high estimation in which advertisements are held by one of a race which faked up the sentimental legend of the faithful hound Gelert, and his death at the hand of the fatuous Llewellyn, and then used the alleged grave of the apocryphal animal as an advertisement with which to draw the pence of maudlin English tourists.

On the subject of Ireland Mr. John is as wide of the mark as ever. Even when the Sinn Fein rebellion was in full blast, the great majority of the Irish people were slaving away with their usual industry, growing food for the thriftless and gluttonous English workman. On the other hand, during the Coventry strike, practically the whole of Coventry was idle, and our soldiers at the front had to suffer for it, and will still have to suffer for it. The suggestion that there was German money behind both rebellions is doubtless justified, but when, to quote Mr. John, "the books are opened," it will probably be found that German money was merely sent to aid those who were already malcontents—an obviously sensible course, from the German point of view.

It is absurd to imagine that German money is the *fons et origo* of all troubles in this or any other Allied country. German diplomacy is not half so clever as some people think, though it may suit the book of our inept Authorities to ascribe to German cleverness evils which are really due to their own imbecility. The absence of the Strong Hand is responsible for more of this country's tribulations than is the presence of the Hidden Hand, tangible though the latter may be.

So much, then, for Mr. Owen John's attack. Let him return to his clowning. Mr. John as the defender of Coventry's virtues is too much like Mr. George Robey playing Prospero to be quite as convincing as he could wish to be.—C. G. G.

#### AIR RAID WARNINGS.

The Commissioner of Police has issued information relating to future procedure with regard to air raid warnings, which

will take the following form during the periods of night and day mentioned.

From half an hour before sunrise until 11 p.m. sound signals will be fired in the Metropolitan Police District from 115 selected centres. From 11 p.m. until half an hour before sunrise sound signals will not be fired if there is time to mobilise the staff required to give the warning by sending round constabulary (regular and special) on foot, on cycles, and in motor-cars carrying illuminated placards, who will sound their whistles and call out "Take Cover." But if this staff cannot be mobilised in time, sound signals will be fired at any hour.

The progressive increase in the speed of aeroplanes makes it probable that there will be a shorter interval between the preliminary and final warning of approach received from the military authorities, and as the streets are full of people until after 10 p.m. and may have to be cleared at very short notice, it has been decided to fire sound signals until 11 p.m.

If the "All Clear" by bugle sound cannot be given within two hours from the time the "Take Cover" warning was made public, this latter warning will be repeated if necessary.

#### THE NEW RATES OF PAY FOR OFFICERS.

The arrangements which have recently been made for augmenting the pay of officers in the Navy and Army are applied to the holders of equivalent ranks in the Flying Services.

As regards the Navy there are graduated increases according to rank and certain allowances in respect of children.

Officers of all regiments in the Army from the rank of second lieutenant to lieutenant-colonel are to receive increased pay, and provision is made for extra allowances in respect of children.

As it is announced that the standard increases will not be paid in full to officers who already enjoy considerably higher pay than the average drawn by officers of equivalent rank, it is not possible to state exactly what the allowance will be as regards officers of the Flying Services.

#### THE CURIOSITY SHOP.

The Trustees of the British Museum, at their meeting on Saturday, expressed their gratitude on behalf of the nation, whose treasures they hold in trust, to the newspapers which so unanimously gave voice to the public disapproval of a proposal which threatened the safety of the Museum and its collections. The Trustees have no doubt that this influential expression of public opinion contributed largely to secure the reconsideration of the proposal.

## LIGHT STEEL STAMPINGS FOR AEROPLANES

Any size or weight:  
Rough or Machined:  
Single Piece or Com-  
bination pressed and  
welded by Oxyacety-  
lene & other processes

JOSEPH SANKEY  
AND SONS, LTD.,

Hadley Castle Works,  
WELLINGTON,  
Shropshire.

#### THE USE OF

## NAYLOR'S Aero Varnishes

WILL ENSURE A  
PERFECT FINISH

Many years' experience combined with up to-date methods and scientific selection of materials ensure the production of varnishes unexcelled for durability and reliability.

Some Specialities  
for Aero Work

Woodfillers, Stains, Air  
Screw Varnish, Spar  
Varnish, Float Varnish,  
White Copal Finish for  
Dope, Enamels, Engine  
Paints, Etc., Etc.

Free Samples for trial  
on application.

NAYLOR BROTHERS (London) Ltd.  
Contractors to all Government Departments.

Offices: 407/9, OXFORD ST., LONDON, W. Works: SOUTHALL MIDDIX.





# Blackburn

*"Always at the Front."*

The BLACKBURN  
AEROPLANE and  
MOTOR CO. Ltd.  
LEEDS  
and HULL

## AIRCRAFT

Are YOU interested in Flying? If so, why are YOU not taking  
**The Nottingham Flying and  
Correspondence Schools, Ltd., Course?**

The Imperial Flying Service Pilots say it is the Best in the Country.

Write for Particulars and Illustrated Book issued Free.

32, KING STREET, NOTTINGHAM.

'Phone 5766.

**BLACK  
ENAMEL.**

**AEROPLANE  
GREY PAINT (flat).  
Oil and Petrol  
Resisting.**

**TRANSPARENT  
WOOD FILLER.**

**Subject to  
A.I.D.  
Inspection.**

**HARLAND'S**  
VARNISHES, ENAMELS  
AND FINE COLOURS.

By Appointment to



His Majesty the King.

**MERTON, LONDON S.W.19.**

ESTABLISHED 1791.

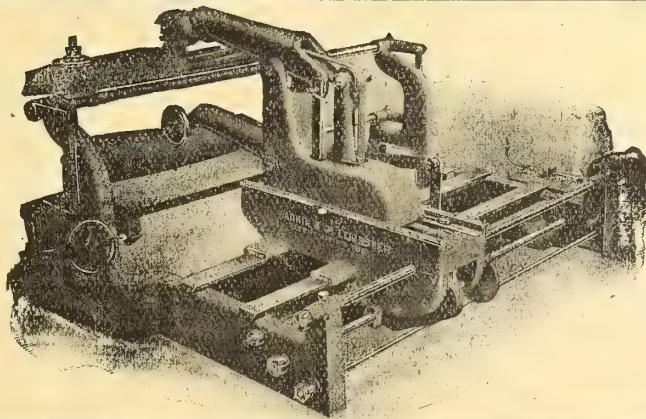
**GOPAL  
VARNISHES  
for  
AIRSCREWS  
and  
EXPOSED  
WOOD PARTS,  
&c.**

**WHITE DOPE  
RESISTING PAINT.**

**Subject to  
A.I.D.  
Inspection.**

**AUTOMATIC  
PROPELLER  
SHAPER  
K.E.**

As supplied to all the  
leading propeller  
makers.



Every blade identical.  
Less balancing required  
Saves labour.  
Increases output.  
Write for list of users.

**WADKIN & CO  
LEICESTER.**

Telegrams: "Woodworker."  
'Phone: 3614/5.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



## THE POOLE AVIATION CO. POOLE, DORSET.

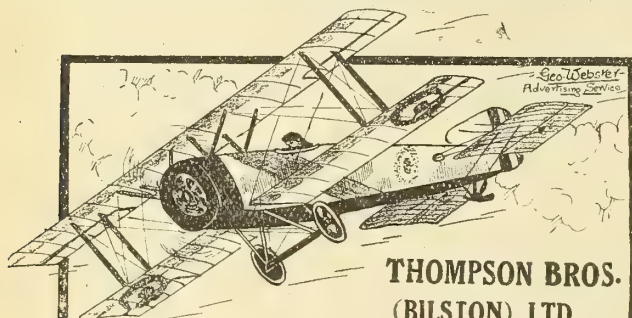
*Contractors to H.M. Government.*

**Spares and all Parts of Machines.**

**ENQUIRIES INVITED.**

'Phone: Poole 54.

'Grams: Aviation, Poole.



**THOMPSON BROS.  
(BILSTON), LTD.,**

— FOR —

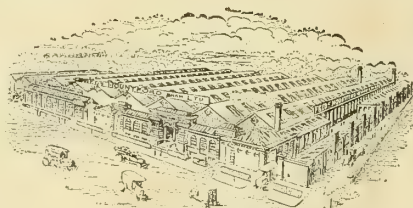
**UNDERCARRIAGES  
TUBULAR FRAMEWORK  
AERO. DEPT., BILSTON, Staffs.**

WE HAVE INVENTED

## THE NON-EVAPORATING DOPE POT

**ARTHUR HILL & Co.,  
SHEET METAL WORKS,  
SILCHESTER ROAD,  
LONDON, W.10.**

Phone—1443 Park.



**A Modern  
Factory  
replete  
with every  
modern  
facility.**

## "FREMO" TAPER PINS.

Every "FREMO" pin is turned out with a view to adding to a lead already won for **THE UTMOST RELIABILITY.**

*Fred Mountford & Son Ltd*

**FREMO WORKS, LIFFORD, BIRMINGHAM.**

## Aeroplane Steel Sheets

as supplied by us to

**The Royal Aircraft Factory  
and leading Aeroplane Makers**

Guaranteed to comply with the R.A.F. No. 9A specification. Stocked in all gauges. (Sheets are passed and stamped by the "A.I.D.")

**BERNARD NICKLIN & CO.  
IRON AND STEEL WAREHOUSE  
SMETHWICK, BIRMINGHAM**

Telegraphic Address:  
"Bernico," Birmingham.

Telephone No. 1  
224 Smethwick.

**"CROID"**  
**LIQUID GLUE**  
'Approved' by 'A.I.D.'  
Sole Manufacturers:  
The Impr. ved Liquid  
Glues Co., Ltd.,  
61, Hermitage Street  
London, E.  
Contractors to H.M.  
Government.

## CLABOUR-WESTBAY

:: FOR ::

**2.B.A. Bolts—A.G.S. 103**

Entire Output at present absorbed  
—by Government Requirements.—

**W. A. Clabour, Westbay & Co.,  
KIRKSTALL, LEEDS. Ltd.**

Phone: Headingley 709.

Telegrams: Clabour, Kirkstall.

## Aluminium Castings



Sand or Die  
of every  
Description

2 HP to 600 HP

BEST METAL  
GOOD CASTINGS  
QUICK DELIVERIES



Contract L to  
H.M. Government

**Chill Castings for  
Aeroplanes a Speciality**

Telephones: Telegrams:  
3846 City. Krakasson,  
4879 Central. Isling, London

**R W COAN**  
The Aluminium Foundry  
219, COSWELL ROAD,  
LONDON, E.C.

COAN  
CASTS  
CLEAN  
CRANK  
CASES



# THE "BOWSER" AEROPLANE SEATS

Under the A.I.D. Inspection.

(Made to A.G.S. Drawing 264).

Supplied to the Royal Aircraft Factory and the Leading Aircraft Manufacturers.

Manufactured by **EDWARD BOWSER, 50, Park Lane, Leeds.** Tel. No.: Central 3473.

Northern Representative—

Mr. WALTER M. DANIELL,

33, East Beach, Lytham.

**EBORA**  
PROPELLER  
Company,  
112/12 Surbiton Park  
Terrace KINGSTON  
on Thames  
Telephone  
KINGSTON 672  
Telegrams  
EBORA, KINGSTON

## Ebora Propellers

Contractors  
to the Admiralty  
and War Office  
SCHOOL PROPELLERS  
FOUR BLADES  
SEAPLANE PROPELLERS  
SLATE TABLES FOR  
PROPELLER WORKS

## RUBBER P.R. TUBINGS APPROVED A.I.D.

'Phone:—CITY 3811 and 3812.

WASHERS, RINGS, BUFFERS, SHEET, STRIP, MATTING, MOULDINGS.

**JAMES LYNE HANCOCK, Ltd., 266 Goswell Rd., London, E.C.1**

TELEGRAMS:  
"EDIBRAO," PHONE,  
LONDON."

## IMPERIAL LIGHT LTD.

123, VICTORIA STREET, LONDON, S.W.1.

TELEPHONE:  
3540 VICTORIA  
(3 LINES).

## FLUXES FOR WELDING

## HEATING

By Steam or Hot Water  
HANGARS, DOPE SHOPS & AIRCRAFT WORKS

CHAS. P. KINNELL & Co., Ltd.,  
65, Southwark Street, London, S.E. 1.

## VENTILATION

## HIDE GLUES FOR AIRSCREWS AND AIRCRAFT CONSTRUCTION.

— APPROVED BY H.M. ADMIRALTY AND A.I.D. —

Manufacturers—**Wm. OLDROYD & SONS, Ltd., 9, Mincing Lane, London, E.C.3.**

Telephone: 4978 Avenue.

## STANLEY PROPELLERS

By the **STANLEY AVIATION CO.,**

TELEPHONE  
DALSTON 45.

CHATHAM PLACE, MORNING LANE,  
HACKNEY, LONDON.

GOVERNMENT  
CONTRACTORS.

Telephone—Works: East 3833. Offices: City 89.

Telegraphic Address—"Gunsigruob, Estrand, London."

## THE STANDARD Aircraft Manufacturing Co., Ltd.

Office: **EFFINGHAM HOUSE, ARUNDEL STREET, LONDON, W.C.**Works at **BOW COMMON LANE, LONDON, E.**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



## TRADE CARDS.

## AEROPLANE TIMBER SPECIALISTS

**JOSEPH OWEN & SONS, Ltd.,**  
**Borough Saw Mills, LONDON, S.E.**

Telephone: HOP 8811    Telegrams: "BUCHERON, SEDIST."

## B.D.V. AIRCRAFT SPARES

ALL KINDS OF METAL FITTINGS, TUBE  
 WORK, SHEET METAL WORK, STAMPINGS,  
 :: WELDING, AND ALL COMPONENTS. ::

Enquiries to **B.D.V. Aircraft Spares,**  
**PRINCES STREET WORKS, RICHMOND, SURREY.**

Telegram: "Aeros. Richmond."

'Phone: Richmond 168r.

**JAMES NORTH HARDY & SON, LTD.,**  
 54, PORTLAND STREET, MANCHESTER.

MANUFACTURERS of all descriptions of COTTON and LINEN  
**WEBS, TAPES & TWINES FOR AIRCRAFT  
 AND ELECTRICAL WORK.**

London Branch: 3, FITCHETT'S COURT, NOBLE STREET, E.C.  
 Mills: HEATON PARK, nr. MANCHESTER.

Tel. Add.: "Hardson," Manchester    'Phone: No. 6471 Central

Trade **MENDINE** Mark.

## LIQUID SCOTCH GLUE

USED BY THE LEADING AEROPLANE CONSTRUCTORS.  
 MOISTURE PROOF.

Write for Price List and Particulars

**MENDINE CO., 8, Arthur Street, London Bridge, E.C.**

## Chauvière's famous Integral Propellers

HOLD ALL RECORDS; USED BY ALL  
 LEADING AVIATORS. THE BEST

Sole Proprietors for Great Britain and Colonies

**THE INTEGRAL PROPELLER CO., LTD.,**

Edgware Road, The Hyde, Hendon, N.W. 9.

Telephone—Kingsbury 104.    Telegrams—"Aviprop, Hyde, London."

**EBORA PROPELLER COMPANY LTD**

*Ebora*

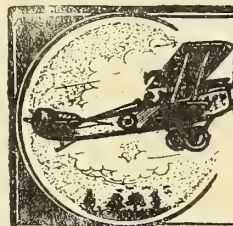
**PROPELLERS**

Contractors to the ADMIRALTY & WAR OFFICE

11 & 12 SURBITON PARK TERRACE, KINGSTON-ON-THAMES

Telephone: KINGSTON 672

Telegram: "EBORA, KINGSTON"



NOW IS THE TIME TO  
**ADVERTISE**

Sketches completed within 48 hours of order.

**AIRCRAFT DESIGNS**  
 A SPECIALITY.

PLACE YOUR ORDER NOW WITH

**J. C. CRABTREE TAYLOR,**  
 153, HIGH ST., POOLE, DORSET.

## Springs! Springs! Springs!

We make a speciality of  
 Springs for Aeroplanes.

SEND FOR PRICES.

**Dart Spring Co., West Bromwich.**

SAVE TIME.

**H. DUNSHEATH & CO.,**

Makers of Every Description of  
 STEEL MARKS, DIES, LETTERS, FIGURES, BRASS  
 STAMPS AND IRON BRANDS.

Seals, Brass, Tin and Zinc Labels, Time Checks, Stencil  
 Plates, Brass Name Plates, Rubber Stamps, &c.

**30, ARUNDEL STREET, SH. FFIELD.**

METRIC BOLTS & NUTS (5 m/m to 8 m/m).

Stock Lists on Application.

**CASHMORE BROS.,**

TELEPHONE:  
 415 BATTERSEA

**Zot  
 Works**

HILDRETH ST.,  
 BALHAM, S.W.

Screw-Cutting and Light Engineering. Accessories for Aircraft.  
 Electrical and Motor Trades. Brass and Iron Founders.

*Advertising*

For GOOD ADVERTISING consult  
 Godbolds, 8, Breams Buildings,  
 London, E.C.4. Estimates Free  
 'Phone: City 5912. E. H. Godbold,  
 Director



**SCREW-DRIVING**  
 RUSSELL BROTHERS, Ltd., REDDITCH  
**MACHINES.**

**FREDK. WARD**

— FOR —

**Aero Engine and Gun Gear Parts**

ALSO PATTERN AND JIGS.

**ALLSOP ST., UPPER BAKER ST., N.W.**

'Phone: Paddington 4743.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# Berling Magneto

insures a hot, fat  
spark at any  
altitude

Worth more  
Does more



Manufactured  
by the  
Ericsson Mfg. Co.  
Buffalo N.Y. U.S.A.

Manufacturers  
.. of ..

**PHOSPHOR BRONZE,**

**GUN METAL,**

**MANGANESE BRONZE,**

**BRASS & COPPER**

TUBES, SHEETS,  
RODS, WIRE, AND

**CASTINGS.**

PHOSPHOR TIN,  
PHOSPHOR COPPER.



**CHARLES CLIFFORD & SON, LTD.,**  
**BIRMINGHAM.**

## EARN WHILE YOU LEARN.

### 'HOW TO MAKE MONEY BY WRITING.'

**£50** IN CASH PRIZES. Send 2d. postage for Particulars and Copy of "How to Earn Money While Learning How to Write for Newspapers and Magazines." Practical and comprehensive Course of Personal and Private Correspondence Instruction in all kinds of Writing—Reports, Articles, Sketches, Verses, Poetry, Songs (words), Short Stories, Serials, etc., by experienced Literary Directors. Work criticised constructively. **Free Advice.** Beginners taught how to make work saleable. MSS. placed for publication at highest rates of remuneration. **Cash paid immediately on acceptance.**

Address: "EDITORIAL" (Dept. R.),  
22, CHANCERY LANE, LONDON, W.C.2.

*The Air Navigation Co., Ltd.*

## BLERIOT & SPAD AIRCRAFT WORKS, ADDLESTONE (SURREY).

**Contractors to War Office and  
Admiralty.**

**Flying Ground—Brooklands Aerodrome.**

**NORBERT CHEREAU, Managing Director.**

Telegrams—Bleriot, Weybridge.

Telephone—353 Weybridge.

## MISCELLANEOUS ADVERTISEMENTS.

### WANTED.

**Wanted Woodwork** for aeroplanes, very large up-to-date factory, fully equipped with latest machines; any class of aircraft work undertaken; prompt deliveries; best work.—Apply Box 3030, THE AEROPLANE, 166, Piccadilly, W.1.

**Engineering Firm** with well-equipped machine shops, now engaged on munitions, solicits inquiries for all classes of turning, drilling, grinding, milling, fitting, etc. Aircraft fittings, also copper pipe work, a speciality. Correspondence with a view to post-war business especially invited.—The Lankester Engineering Co., 39, Eden Street, Kingston-on-Thames.

**An Old-established Firm**, with up-to-date woodworking machines, wishes to take contracts for small parts for aircraft.—First-class workmanship and quick deliveries guaranteed.—Apply Box 3279, THE AEROPLANE, 166, Piccadilly, W.1.

**Wanted**—50-hp. Gnome nosepieces, long type—same type as used in the late 50-hp. Gnome-Blériots.—Full particulars to London and Provincial Aviation Co., Stag Lane, Edgware.

### AIRCRAFT PARTS.

**Hardwood for Aeroplanes.**—Specially Selected air-dried timber as supplied to leading constructors in Britain and the Continent. Silver Spruce, Ash, Poplar; Hickory and Ash Skids; Three-ply; Thin Cedar and Mahogany for Floats; Walnut for Propellers.—William Mallinson and Sons, Ltd., Hackney Road. 'Phone, 3845 Central, 4770 Wall.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

**Tapes, Webs, Cords and Threads** in all qualities, suitable for Aircraft Work. Delivery from stock.—John MacLennan and Co., 30, Newgate Street, London, E.C.1. (See Advertisement Page iv of Cover and Buyers' Guide.

**Aeroplane Seats** to any drawing or specification. Prompt deliveries.—F. C. Chappell, Cane Works, 9, Fisher Street, Nottingham.

**A.G.S. and Standard Petrol Fittings in G.M.**, petrol cocks, filters, etc., to B.P. engine, and petrol details from the bar.—H. Burton and Co., Ltd., Cannon Works, Willesden, N.W.10.

**Aeroplane Seats.** We can give quick delivery of cane seats, A.G.S. 264 or other patterns, guaranteed pass inspection. Write us for anything required in cane work.—The Willowbrook Company, Leicester.

### MISCELLANEOUS.

**£30 Reward**, which will lead to the recovery of a 11.9 two-seater "Perry" car, painted green, Lucas black lamps, Dunlop tyres, all springs covered black leather. Missing from Harewood House, Hanover Square, W., 7.30 p.m., Jan. 2nd.—Information should be sent to L. S. B. H., 4, Queen's Gate, S.W., or to the nearest police station.

### AVIATION INSTRUCTION

on up-to-date lines, by a qualified Engineer in Aeronautics. Demonstrations from complete set of parts, and sectioned models.

Send for Prospectus No.1.A.,

**THE MOTOR TRAINING INSTITUTE LTD.,**

10, Heddon Street, Regent Street, W.1.

**Nerve Failure** speedily cured, self-consciousness eliminated, concentration increased, and confidence restored by sympathetic hypnotic suggestion. Interesting explanatory booklet post free.—Robert McAllan, Regent House, Regent Street, W.1.

### FOR SALE.

**Sites for Aircraft Works and Aerodromes.** Manufacturers requiring the above in the Western Suburbs of London should avoid delay and waste of time in seeking same by applying to Messrs. Tyser, Greenwood and Co., Surveyors, 360, High Road, Chiswick, who will be pleased to forward particulars of excellent sites and give fullest details and plan on application at their offices, 360, High Road, Chiswick, W.

**For Disposal.**—Valuable motor business premises, with two houses and land adjoining, situated on main Farnborough and Aldershot road.—For particulars, apply Hollest, Mason, and Nash, Solicitors, Aldershot.

**Aeroplane Radiators.**—The Gallay Radiator Company, Limited, stock Aeroplane Radiators. For the benefit of Constructors, can supply radiators for experimental purposes at a nominal cost. Advice given on suitable types for the various approved engines. Our drawing office is always at our clients' disposal.—198, Great Portland Street, London, W.1.

### ENGINEERING

**British School of Aeronautics.**—Aircraft Engineering Course; Aero Design; Aero Construction; Aero Draughtsmanship; Mechanical Engineering.—Pennington's, 254, Oxford Road, Manchester.



## MISCELLANEOUS ADVERTISEMENTS.

**SPECIAL PREPAID RATE: 18 words 1/6; Situations Wanted ONLY, 18 words 1/-; 1d. per word after. TRADE ADVERTISEMENTS, in these columns, 3 lines 3/-; 10d. per line after. Public Announcements, Legal Notices, Auctions, Contracts, etc., 1/6 per line. For the convenience of Advertisers, replies can be received at the offices of "THE AEROPLANE" 166, Piccadilly, 11cccn. W.I.**

## PATENTS.

**PAGE & ROWLINSON**, Chartered Patent Agents (Consulting Engineer, Mr. S. E. Page, A.M.Inst.C.E.), 27, Chancery Lane, London, W.C. Tel. 332 Central.

**Henry Skerrett**, Chartered Patent Agent, 24, Temple Row, Birmingham.—Patents, trade marks, and designs.

**Inventors advised free.** Write for booklet.—King's Patent Agency, Ltd., 165, Queen Victoria Street, London. 30 years' references.

**Stanley, Popplewell and Co.**, Patent Agents and Consulting Engineers. Applications for Patents attended to in all countries.—38, Chancery Lane, W.C. Telephone: 1763 Central. Circular free.

## SITUATIONS VACANT.

**Fitters** wanted for rudders, fins, elevators, sternposts, under-carriages, spar boxes. Good price given. Day-work or piece-work. No one residing more than ten miles away or already engaged on Government work need apply.—The Swift Aviation Co., Richmond Road, Kingston-on-Thames.

**Wanted, Sheet Metal Workers, fitters, and turner-fitters**, must be first-class men. No one on Government work or residing more than ten miles away need apply to:—Harley Works, Beckton Road, Plaistow, E.16.

**Good Engineering Draughtsman** wanted, with some experience of aeronautical work preferred, but not essential. Those on Government work need not apply.—Write, stating experience and salary required to nearest Employment Exchange, mentioning this paper and Box No. 3246.

**Woodworking Foreman** for large department in aeroplane works, south of England. Must be successful controller of labour, good organiser, capable of fixing piece-work prices, and able to increase output. No one on Government work need apply.—Applications must be made through nearest Employment Exchange, mentioning this paper and Box No. 3275.

**General Charge-hand** required for inspection department of aeroplane factory, London, N.W. State age, experience and wages required. No one need apply who is residing more than ten miles away or engaged on Government work.—Box 846, Sells, Ltd., 168, Fleet Street, E.C.4.

**Viewer** required, with experience of aeroplane wood parts. No one need apply who is engaged on Government work or not living in London.—Write, giving age and wages required, to Box 845, Sells, Ltd., 168, Fleet Street, E.C.4.

**Chief Draughtsman** wanted for experimental aeroplane work; good position for man with first-class experience. State age, qualifications, experience and salary required to nearest Employment Exchange, mentioning this paper and Box 3266. No one already on Government work can be engaged.

**Fitters—Aircraft.** Wanted immediately for the metal-working department of a large aircraft factory on the South Coast. Must be experienced tube and general metal workers, for making and assembling detail metal parts. Good opportunities for the right type of men. No one on Government work need apply.—Apply in first instance, stating experience and wages required, to nearest Employment Exchange, mentioning this paper and Box No. 3272.

**Clerk** required for aircraft factory as quantity and ordinary clerk, used to progress work, with a knowledge of firms supplying aircraft parts and able to keep stores always up to date. Excellent prospects for good man. No one engaged on Government work need apply, or residing more than 10 miles away. S.W. district.—Box No. 3273, THE AEROPLANE, 166, Piccadilly, W.1.

**Required at Once**—Foreman for engineers shop—One hour from London. Must be fully acquainted with production and employment of female labour. A really live man required. Good salary and conditions. No one on Government work need apply.—Applications must be made through nearest Employment Exchange, mentioning this paper and Box No. 3285.

**Required, Lady Tracers** for aeroplane factory, London district. Previous experience essential, preferably of engineers' drawings. No person residing more than ten miles away or already engaged on Government work need apply.—Reply, stating age, full particulars of experience and salary required, to Box 3282, THE AEROPLANE, 166, Piccadilly, W.1.

**Required, Outside Representative**, with initiative and knowledge of engineering accessories for London aeroplane factory. No person residing more than ten miles away or already engaged on Government work need apply.—Reply, stating age, full particulars of qualifications and salary required, to Box No. 3281, THE AEROPLANE, 166, Piccadilly, W.1.

**Cost Clerks** required, male or female, for aeroplane factory, London district, preferably with engineering costing experience and card systems. No person residing more than ten miles away or already engaged on Government work need apply.—Reply, stating age, particulars of qualifications and salary, to Box 3280, THE AEROPLANE, 166, Piccadilly, W.1.

**Wanted, Experienced Draughtsman** for leading firm of aircraft engineers in North London. Previous experience in aircraft work not essential. No person already engaged on Government work or residing more than ten miles away need apply. Reply to Box No. 3287, THE AEROPLANE, 166, Piccadilly, W.1.

**Aeroplane Stresses**.—Vacancy for assistant having first-class experience of latest methods and Air Board requirements in this work.—Apply, stating age, qualifications, experience and salary required, to Employment Exchange, mentioning this paper and Box No. 3267. No one already on Government work can be engaged.

**Storekeeper** for aeroplane works in Surrey. Up-to-date man with efficient methods required.—State full details of experience and salary required to Box No. 3276, THE AEROPLANE, 166, Piccadilly, W.1.

## SITUATIONS WANTED.

**Works Manager**.—Aero engine manufacturer is open to offer from progressive firm. Has had first-class experience in manufacture of rotary and stationary engines from laying out of shops, plant, and tool equipment to actually producing in quantities to R.A.F. and Adm. specifications.—Apply to Box 3239, THE AEROPLANE, 166, Piccadilly, W.1.

**Gentleman**, aged 49, discharged from Army last February, requires situation national importance, where knowledge of timber, measurements, calculations, would be useful.—Box No. 3238, THE AEROPLANE, 166, Piccadilly, W.1.

**Draughtsman**, 23, discharged from Army, 5 years' experience, seeks position; moderate salary.—Write Box No. 3257, THE AEROPLANE, 166, Piccadilly, W.1.

**Assistant to General Manager**, large aeroplane factory, seeks opening as commercial manager or similar position. Acquainted with Air Board routine, and accustomed to handling large volume correspondence respecting big contracts machines and spares. Proved organising ability. General knowledge all branches. Excellent references. Low medical grade.—Box 3259, THE AEROPLANE, 166, Piccadilly, W.1.

**Works Manager**, or position of trust, 37, practical engineer, invaluable experience both aeroplanes and seaplanes. Tactful, energetic, methodical organiser, accustomed to latest service methods and capable of economically increasing production.—Box 3284, THE AEROPLANE, 166, Piccadilly, W.1.

**Draughtsman**, seeks spare-time work, used to motor body and aeroplane work, any work treated with strict confidence.—Apply Box 3283, THE AEROPLANE, 166, Piccadilly, W.1.

**Engineer**, 27 (acting assistant works manager, manufacturing crankshafts, 15 months), specialised on internal-combustion engines, two years' D.O. experience, and technical training, desires post as assistant to engineer.—Apply Box 3288, THE AEROPLANE, 166, Piccadilly, W.1.

**Works Manager**, assistant or works foreman, well up all branches aircraft construction. Expert on timbers, practical knowledge building, sawmill plant, erecting and working, good organiser, disciplinarian. Age 43. Salary, subject to mutual arrangement.—Box No. 3286, THE AEROPLANE, 166, Piccadilly, W.1.

**Works Manager**, first-class engineer, experienced in aeroplane and seaplane construction, desires appointment with first-class firm. Modern methods of production, strict disciplinarian, tactful, controller of labour.—Apply Box No. 3271, THE AEROPLANE, 166, Piccadilly, W.1.

**Foreman**, experienced in propeller and seaplane construction; draughtsman and good disciplinarian; first-class references.—Box 3270, THE AEROPLANE, 166, Piccadilly, W.1.

**Assistant Foreman** of large aircraft factory requires re-engagement. Experienced fitter, jig and tool work. Capable organiser and strict disciplinarian. Good testimonials.—Apply Box 3269, THE AEROPLANE, 166, Piccadilly, W.1.

**Axles**, squad and fitters, experienced in all aircraft fitting and assembling, production guaranteed. Box No. 3268, THE AEROPLANE, 166, Piccadilly, W.1.

**Aircraft Management** upon modern and productive lines. Engineer with expert staff, is prepared to negotiate with financier contemplating the manufacture of aircraft, or will undertake the reorganisation of existing factory. Principals only.—Box No. 3278, THE AEROPLANE, 166, Piccadilly, W.1.

**As Manager** or assistant in aircraft factory. Several years' experience as manager. Fully conversant with up-to-date methods of aircraft construction. Good organiser, excellent references.—Box 3277, THE AEROPLANE, 166, Piccadilly, W.1.

**Mill Manager** or supervisor requires appointment. Thoroughly practical in the use of all woodworking machinery. Up-to-date methods of machine-shop production. Spindle work a speciality. Timber expert.—Box No. 3274, THE AEROPLANE, 166, Piccadilly, W.1.



## WYCOMBE AIRCRAFT CONSTRUCTORS, Ltd.

HEAD OFFICE :

57, LONDON ROAD, HIGH WYCOMBE.

Telephone—HIGH WYCOMBE 84.

Telegrams—"AIRCRAFT, HIGH WYCOMBE."



STORES & RECEIVING OFFICE,  
HIGH STREET, HIGH WYCOMBE.

Telephone.....HIGH WYCOMBE 120.

TIMBER YARD  
AND SAWMILLS  
OXFORD ROAD.



## HANDLEY PAGE LTD.

CONTRACTORS TO  
THE ADMIRALTY  
AND WAR OFFICE  
.....

CRICKLEWOOD LANE,

HAMPSTEAD 7420 (3 LINES)

LONDON, N.W. 2.

"HYDROPHID, CRICKLE," LONDON.



Telephone: City 3115. ESTABLISHED 1875 Telegrams: "Vanduaara Cent. London."

**TAPES, WEBS,**  
**CORDS & THREADS**  
*for Aircraft*  
*Electrical & Munition Work.*  
*Delivery from Stock.*

**JOHN MACLENNAN & CO**  
 30 NEWGATE ST LONDON E.C.1.  
 AND AT GLASGOW.

*Contractors to H.M. Government.*



CONTRACTORS TO THE ADMIRALTY.

**SHORT BROTHERS,**  
**AEROPLANE WORKS,**  
**ROCHESTER, KENT,**  
 AND  
**FLYING GROUNDS,**  
**EASTCHURCH, ISLE OF SHEPPEY.**

Telephones:—

9, EASTCHURCH.  
 627, CHATHAM.



Telegraphic Addresses:—

"FLIGHT, EASTCHURCH."  
 "SEAPLANES, ROCHESTER."

EDITORIAL AND ADVERTISEMENT OFFICES, 166, PICCADILLY, W.1.

Printed for THE AEROPLANE AND GENERAL PUBLISHING CO., LTD., by BONNER & CO., The Chancery Lane Press, Rolls Passage, London, E.C.; and Published by THE WM. DAWSON PUBLISHING COMPANY, LTD., at Rolls House, Breams Buildings, London. Branches in Canada, Toronto, Montreal, and Winnipeg; in South Africa: Cape Town, Johannesburg, and Durban.



# THE AEROPLANE

WEDNESDAY, JAN. 30 1918.

Edited by  
C. G. Grey

Vol. XIV. No. 5

THREEPENCE WEEKLY

[Registered at the G.P.O.]  
as a Newspaper.

## THE NORMAN THOMPSON FLIGHT CO. Ltd.

ESTABLISHED 1909

Telegrams—SOARING, BOGNOR  
ENTIFLYTE CHARLES, LONDON

Works—MIDDLETON, BOGNOR

CONTRACTORS TO THE ADMIRALTY

Telephones—BOGNOR 48. GERRARD 7385

London Office—  
DEWAR HOUSE, 11, HAYMARKET, S.W.1.

DESIGNERS AND MANUFACTURERS OF FLYING BOATS AND LAND PLANES

**Auster** FOR **Aero-shields**  
LONDON. BIRMINGHAM

**BEARDMORE** AERO  
ENGINES

**TITANINE**  
NON-POISONOUS  
**DOPE**  
SEE ADVERT. INSIDE.

**ACCLES & POLLOCK, LIMITED**

WELDLESS STEEL TUBES — OLDBURY, BIRMINGHAM.

**TRIPLEX** Safety **GLASS**



. THE .  
**ENGINEERING TIMBER CO. Ltd.**

11, Victoria Street, London, S.W.

J. E. HUSON, Managing Director.

Telephone : Victoria—3073, 4210

Telegrams : Entikosil, Vic. London.

**SILVER SPRUCE**

**ASH**

**WEST VIRGINIAN SPRUCE**

**WALNUT**

**MAHOGANY**

**GLASGOW :**

**67, HOPE STREET.**

Telephone : Central 3273.

Telegraphic Address : Entikosil, Glasgow.

**PARIS AGENCY :**

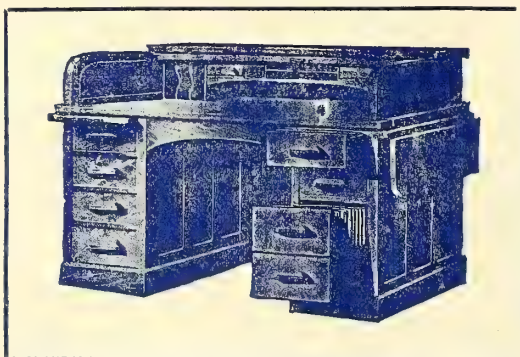
**6, RUE DE HAVRE, PARIS.**

# Factory & Office Furniture

LARGEST STOCK FOR IMMEDIATE DELIVERY.

(NEW AND SECOND-HAND)

SPECIALITÉ



SAFES.

**COOKE'S (FINSBURY) LTD.**

INCORPORATING

The FINSBURY OFFICE  
FURNISHING Coy.

&

J. W. COOKE  
& Coy.

FINSBURY PAVEMENT HOUSE, LONDON, E.C.2.

Telephones : LONDON WALL } 6179.  
573.

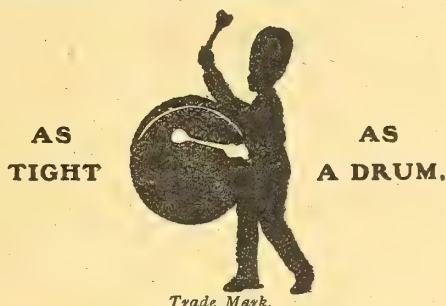
See Telephone Book relating to our Shopfitting, Signs and other Departments.



# EMAILLITE

NON-POISONOUS  
AEROPLANE DOPE.

THE ORIGINAL AND STILL THE PREMIER.



THE BRITISH EMAILLITE CO., LTD.,

*Contractors to the Air Board.*

Registered Offices:

30, Regent Street, Piccadilly, S.W.1.

Wire—"Ridleyphen, Piccy, London."

"Phone—280 Gerrard

Works

5, Hythe Road, Cumberland Park,  
Willesden Junction, N.W.10.

Telephone—Willesden 2346 & 2347.

Metal  
Fittings  
a  
Speciality.

**The Aero Mechanical Co., Ltd.**  
CONTRACTORS TO THE AIR BOARD.  
60-66, ROCHESTER ROW, LONDON, S.W.1.

Telephone:  
Vic. 7570 (3 lines).

Managing Directors:  
E. Salomon, J. Fogelson

Complete Fittings  
and Dies in Stock for  
latest D.H. Machines;  
also most of the Fittings  
for other D.H. Machines  
and Handley-Page.

Our reputation has been built up by our ability to effect  
deliveries right up to time.

KINDLY MENTION "THE AEROPLANE"

WHEN CORRESPONDING WITH ADVERTISERS.

# LEARN TO FLY

— AT —

## Bournemouth.

— THE —

**LARGEST AND MOST UP-TO-DATE  
CIVILIAN SCHOOL IN ENGLAND.**

*Immediate Vacancies.*

*Run under Rules approved by the Royal Aero Club.*

**RAPID TUITION.**

43 Caudron Service Biplanes (Solo & Dual Control),

**SPECIAL TRAINING**

for Pupils intending to enter the R.F.C. or R.N.A.S.

**APPLY :**

**Bournemouth Aviation Co., Ltd.,**  
AERODROME, BOURNEMOUTH. (Phone 1160).

# Alardux

**Alardux is the New Aluminium Flux**

**A Welding Flux of exceptional merit**

**May we send you a sample ?**

**The Alardux Co.,**  
23, Fleet Street,  
London, E.C.4.

City 866.

## THE BRITISH WRIGHT CO. LTD.

Owners of the British, Italian and Belgian Patents  
of Wilbur and Orville Wright.

*Manufacturers of*  
**AERONAUTICAL  
INSTRUMENTS**  
FOR  
NAVY & ARMY AEROPLANES

**McIlvrie Air Speed Indicators**

for use on Aeroplanes, Airships, Kites,  
Balloons and Air Stations.

**Statoscopes.**

**Recording Manometers.**

**Wind Speed Recorders.**

At present the Government is taking the entire output, but  
British and Foreign firms are invited to place their orders  
now for delivery of Aeronautical Instruments after the War.

**The BRITISH WRIGHT Co. Ltd.**  
33, CHANCERY LANE, LONDON, W.C.2.

## CHAUVIÈRE'S Integral Propellers



are used more extensively than  
any other Propeller in  
the World.

**Hold all Records and are  
indisputably the best.**

**Maximum Efficiency.**  
**Best Workmanship.**

**THE INTEGRAL PROPELLER CO., LTD.**

Edgware Road, The Hyde, Hendon, N.W.9.

Telegrams: "Aviprop, Hyde, London." Telephone Kingsbury 104.



The Hollow Structure and Aircraft Co., Ltd., Patent.

## WOOD PROBLEM SOLVED.

# HOLLOW SPARS

And Struts for all types of machines.

Any length, shape or section without joints.

FULL PARTICULARS FROM THE SOLE LICENSEES,

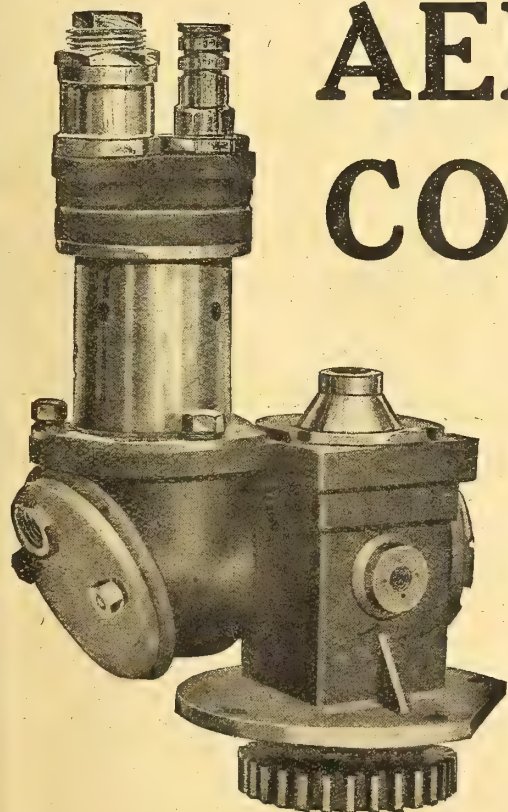
ROBERT YOUNG'S CONSTRUCTION CO., LTD.,

AIRCRAFT CONTRACTORS,

CANONBURY WORKS, ESSEX ROAD, LONDON, N.

TELEPHONE—  
DALSTON 2985.

TELEGRAMS—  
BYLDINCONT NORDO LONDON."



# AERO ENGINE COMPONENTS

MANUFACTURED BY THE

## SELSDON

**Aero and Engineering Co.  
Limited**

IMPERIAL HOUSE,  
KINGSWAY, W.C. 2.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISEES

# Aircraft Fittings.

## GABRIEL & CO.

**Manufacturers of  
AEROPLANE FITTINGS in BRASS,  
COPPER, GUN METAL, BRONZE  
AND CLARUS ALUMINIUM.**

Castings supplied either Machined complete  
or in the rough.

Sheet Metal Work in Brass, Copper, Steel,  
Tin, or Aluminium, including Spinnings,  
Stampings and Pressings.

**A.G.S. FLANGES, PETROL FILTERS, ETC.**

Tube Bending and Capstan Work a speciality.

**Contractors to Admiralty, War Office,  
Ministry of Munitions, H.M. Air Board,  
Royal Aircraft Factory and Crown  
Agents for the Colonies.**

TEL. ADDRESS:  
GABRIEL, BIRMINGHAM  
TELEPHONE:  
CENTRAL 1223.

**4 & 5, A. B. ROW,  
BIRMINGHAM**

CONTRACTORS TO H.M. GOVERNMENT

# W.T. CLARK & CO.

Telephone  
No.  
Central  
2121.

5, GREEN TERRACE,  
ROSEBERY AVENUE,  
LONDON, E.C.1.

Telegrams  
Etalspinne  
Listing London  
Two Words

## METAL SPINNERS

and

## SHEET METAL WORKERS

for Aeroplane Constructors

METAL SPINNINGS for AEROPLANES

Cowlings (COMPLETE SET)  
Coverings  
Undershields

Fairings  
Petrol Tanks  
Shields etc.

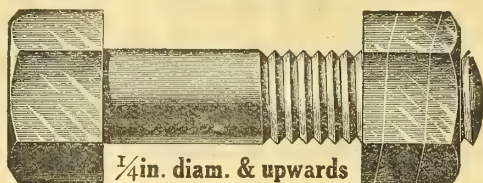


BEATEN COWLS  
OF EVERY  
DESCRIPTION

SPUN COWLS  
UP TO  
48 INCHES  
IN DIAMETER.



## BRIGHT BOLTS & NUTS



1/4 in. diam. & upwards

(Suitable for Every Description of Engineering Work)

**QUALITY, ACCURACY AND FINISH GUARANTEED**

**THE  
"HELICOID" LOCK-NUT**

(THE FINEST LOCK-NUT IN THE WORLD.)

This nut will remain secure, no matter how great  
the vibration may be—in fact vibration actually  
tightens the grip.

(made from 1/2 in.  
to 2 1/2 in.)



(sample nut & prices  
on application)

We also manufacture Wrought Iron Railing and Gates, etc.

**BAYLISS, JONES & BAYLISS,  
WOLVERHAMPTON.**

London Offices: 139/141, CANNON ST., E.C.4.

## HIGH-CLASS ALUMINIUM CASTINGS

FOR ALL TRADES.

We Specialise in Aluminium Cylinders and  
General Aero and Motor Engine Castings,

## CAST IRON CYLINDERS

Water and Air-cooled for Aero & Motor Engines

ALL THE ABOVE CASTINGS  
TO GOVERNMENT SPECIFICATION.

**WILLIAM MILLS, LTD.,**  
Atlas Works :: Grove Street,  
**BIRMINGHAM.**

ALUMINIUM AND IRON FOUNDERS.



Telegraphic Address: POETRY, 'PHONE LONDON.  
Telephones: AVENUE 995, 996, 7996.

(Partners:  
H. W. PRITT,  
W. G. PRITT,  
P. W. SMALLWOOD,  
E. R. HILL),

## PRITT & CO.

METAL WAREHOUSEMEN, MUNITION  
AND AERONAUTICAL CONTRACTORS

46, FENCHURCH STREET,  
LONDON, E.C. 3,

Where all communications must be addressed.

CITY WAREHOUSES: 62a, Vine Street, Minorities, E.  
9, Jewry Street, Aldgate, E.C.  
DEPOTS: Paddington, Poplar, Shoreditch.

We hold good stocks, complying with Air Board, R.A.F.  
and Admiralty Specifications, of the following:

BRASS & COPPER in sheets, tubes, rod, wire, etc.  
TINNED STEEL SHEETS.  
MILD STEEL SHEETS, 9a.  
BRIGHT DRAWN MILD STEEL BARS, 3a.  
A. G. S. BOLTS, NUTS AND WASHERS.  
COPPER RIVETS. TINMAN'S SOLDER.  
SOLDERING IRONS.  
BEST SWEDISH WELDING WIRE.  
BRAZING SOLDER in wire and granulated form.  
SILVER SOLDER. WIRE GAUZE, &c.

All material passed A.I.D. before despatch.

DAILY DELIVERIES made by our own vans within a radius of  
15 miles of our Warehouses.

NOTE.—All orders for Aeronautical Work receive especially  
prompt attention.

WE ARE BUYERS OF SCRAP BRASS & COPPER.

## PROPELLERS ONLY.



CONTRACTORS TO  
H.M. GOVERNMENT



Office & Works—  
Propeller Works,  
Balm Road,  
Hunslet,  
Leeds.

Telephone—  
Central 291.  
Telegrams—  
Airscrews, Leeds.

Contractors to H.M. Government.

## SWIFT AVIATION CO.

Dolphin Engine Plates in Stock,  
Complete Sets.

*Speciality Sopwith Spares.*

## KINGSTON

PHONE—  
762 KINGSTON

'GRAMS—  
"SWIFT, KINGSTON"

## Bowden Wire Ltd.



LONDON

BEING wholly engaged  
upon production for the  
British and Allied Governments,  
we regret that we are unable for  
the present to execute any orders  
for private purposes.

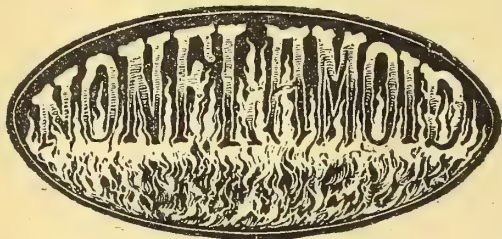
Victoria Road, Willisden Junction,  
N.W. 10.

Established 1897.

Goldbolds



Registered Trade Mark.



Non-Inflammable Transparent Celluloid.

**LONDON LABEL CO., Ltd.,***Contractors to H.M. Government.***HARLEY WORKS, BECKTON RD., LONDON, E.**

**WIND SHIELDS  
MAP COVERS  
OBSERVATION PANELS**  
*Prompt deliveries of every type.*  
**LUMINOUS PRINTING**

Labels for Instrument boards, &amp;c., for night work.

Any special article made up to templates or drawings and delivered by return.

N.B.—Nonflamoid is very much lighter and easier to work than any kind of glass, also it will stand much harder usage.

**“NOVELLON” DOPE  
AND AEROPLANE VARNISH.  
CELLULOSE ACETATE & CHEMICALS**

**BRITISH CELLULOSE & CHEMICAL MANF'G.  
COMPANY, LIMITED.**

Telegrams :

Cellutate, London.

**8, WATERLOO PLACE, S.W.1.**

'Phone : Regent 4045.

Works : Spondon, Derby ; and Maybury Gardens, High Road, Willesden Green, N.W.10.

(Telephone : Willesden 2380.)

**THE AIRCRAFT CONSTRUCTION CO.**

EVERY DESCRIPTION OF METAL COMPONENTS.

**IMMEDIATE  
DELIVERY OF**

**SE5 SUMPS, part 11612-1**

**HARLEY AEROPLANE WORKS, Beckton Rd., E.16**

Telegrams : “Aercracons,” Canning, London.

'Phone : East 1300.

**PLYWOOD**

**In all Thicknesses and Qualities.**

**SIBERIAN & GENERAL TRADING CO., Ltd.,**

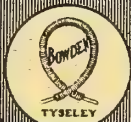
**1-3, Leonard Street, City Road, LONDON, E.C.2.**

Telegraphic Address : “Wolosey, Finsquare, London.” Telephone : London Wall 3577.

KINDLY MENTION “THE AEROPLANE” WHEN CORRESPONDING WITH ADVERTISERS.



# Bowden, Tyseley.



for  
**BOWDEN  
CONTROLS**  
and  
**BOWDEN CABLES**  
for all  
**AEROPLANE  
PURPOSES.**

Quotations on application.

Note Address—

**The BOWDEN BRAKE  
Co., Ltd., Tyseley,  
B'HAM.**

R. H. G.

Of special  
interest to  
Government  
Contractors  
*Not Mill furnishing or Hydraulic*

## J.B. BROOKS & CO. LTD.

Contractors to the Admiralty and War Office,  
Air Board, Ministry of Munitions, etc.,  
and the Leather Specialists with the  
Largest Works, Finest Equipment,  
Best Facilities and Widest Experi-  
ence in the Trade. Invite enquiries  
for

Articles, Parts, Fitments,  
and Cases of

# LEATHER

Address  
**J.B. BROOKS & CO. LTD.**  
104, Criterion Wks. Bham

1082

### AIRCRAFT DEPARTMENT

THE WORLD'S LARGEST MANUFACTURERS OF ALL KINDS OF ENGRAVED METAL GOODS

## British Metal (Kingston) Ltd.

*The Factory,*

Kingston-on-Thames

**DIALS & INSTRUCTION PLATES**  
MADE IN ANY METALS,  
IVORY, IVOROID, BONE, ETC.  
ANY QUANTITIES, WORDING, DESIGN,  
SIZE, SHAPE OR COLOURS.

COMPLETE SHEET METAL  
**AIRCRAFT COMPONENTS**

RIVETED, SWEATED, BRAZED OR WELDED.

**R.E.8, F.E.2B.&D, B.E.2C-D-E,  
SE5, De H6.**

RESIDENT A.I.D. EXAMINER.

THE USE OF

# NAYLOR'S Aero Varnishes

WILL ENSURE A  
PERFECT FINISH

Many years' experience  
combined with up-to-date  
methods and scientific se-  
lection of materials ensure  
the production of var-  
nishes unexcelled for  
durability and reliability.

Some Specialities  
for Aero Work

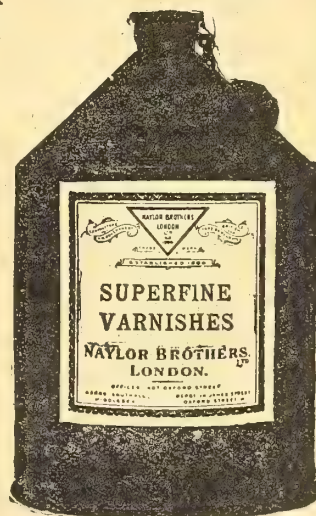
Woodfillers, Stains, Air  
screw Varnish, Spar  
Varnish, Float Varnish,  
White Copal Finish for  
Dope, Enamels, Engine  
Paints, Etc., Etc.

Free Samples for trial  
on application.

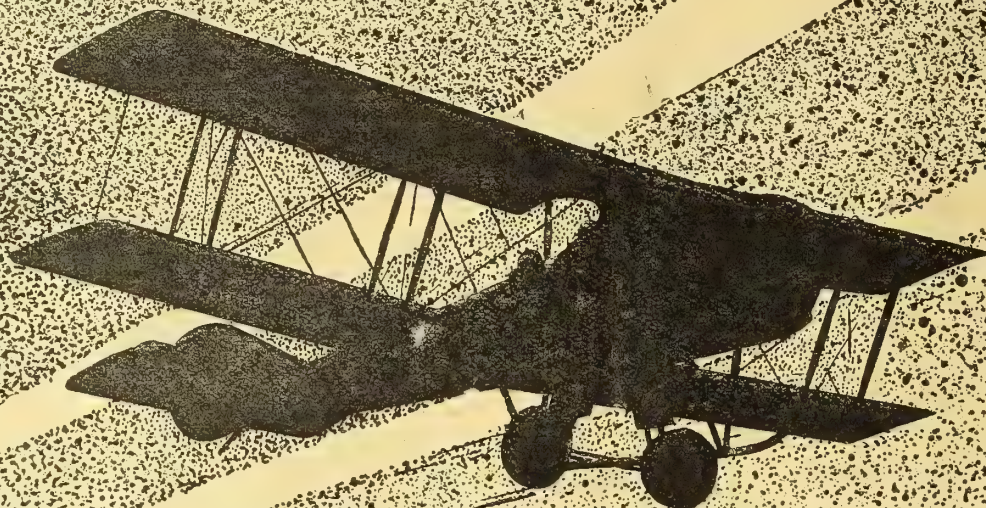
**NAYLOR BROTHERS (London) Ltd.**

Contractors to all Government Departments.

Offices: 407/9, OXFORD STREET, LONDON, W. Works: SOUTHALL MIDD.







# AVRO

## NOTHING BETTER

### AVROE & CO. LTD.

TELEGRAMS  
TRIPLANE

MANCHESTER

TELEPHONE  
CITY 1537



# The AEROPLANE

The Editorial and Advertising Offices of "The Aeroplane" are at 166, Piccadilly, London, W.1.  
 Telegraphic Address: "Aileron, London." Telephone: Mayfair, 5407.  
 Accounts, and all correspondence relating thereto, should be sent to the Registered Offices of  
 The Aeroplane and General Publishing Co., Ltd., Rolls House, Breams Buildings, E.C.4.  
 Subscription Rates, post free: Home, 3 months, 8s. 10d.; 6 months, 7s. 7d.; 12 months, 15s. 2d.  
 Foreign, 3 months, 8s. 0d.; 6 months, 10s. 0d.; 12 months, 20s. 0d. Canada, 1 Year, \$4.70c.  
 U.S.A., 1 Year, \$5.20c.

## ON THE GADARENE SWINE.

In his proper place the pig is a useful and even a likeable animal, by no means devoid of intelligence. Early motorists will remember that the pig was the first of all animals to learn that the automobile is a power to be avoided and treated with respect, consequently the pig on the road soon learned to retire gracefully to the ditch and let the car pass in peace, while yet the cow and the ass stupidly obstructed traffic and got themselves hurt, and the horse had hysterics and hurt himself. Therefore it has always seemed that the Gadarene swine of the parable were somewhat unfairly treated. Just why a herd of perfectly good pigs should be afflicted with devils and be driven to rush down a steep place into the sea to perish in the waters is hard to understand, especially when one considers that all this excellent pork was wasted merely to save a lunatic Jew who is not recorded as being of any particular use after his devils had been exorcised.

Something very similar seems to be happening to-day. The devils of lunacy which afflicted our politicians before and early in the war, when they nearly brought this country to ruin, and were prevented from doing so by the British Army, seem to have passed from them, leaving them merely exhausted imbeciles instead of dangerous maniacs. These devils seem now to have possessed a large portion of the working men of this nation, with the result that the whole herd seems to be on the point of rushing down and perishing in the waters of anarchy. It remains to be seen whether the original Gadarene miracle is to be bettered, and whether the harmless necessary pigs are to find a saviour who will cast out their devils and save them, much as the lunatic was saved.

Again it is possible that the Army may be the saviour if only those having authority will pluck up their courage and boldly conscript those who are causing the trouble. A few weeks of military discipline would soon exorcise the devils of anarchy which possess these people.

### A MISTAKEN IDEA.

One hears much of the discontent and of the disloyalty of the working classes. But the idea that the working classes are disloyal as a whole is entirely erroneous. The working classes—or perhaps one should say the wage-drawing classes—are very clearly divided into three kinds. First there are the thoroughly loyal sort, who want to win the war and are prepared to make any sacrifice to win it. They are actually the biggest single section. Secondly there are the weak-minded, easily led, ignorant people, who are the next largest section. And thirdly there are the thoroughly disloyal class, which is the smallest and noisiest.

This class is almost entirely composed of young men of military age, partly educated, soaked with absurd Socialistic doctrines which teach them that one man

is as good as another, though they do not explain why one man is as good as another socially when it is perfectly evident that men are not equal mentally or physically. They cannot see that the cripple son of a millionaire has precisely the same grievance against a healthy coal-heaver as the healthy coal-heaver has against the father of the millionaire. They were both born so, and there is an end of it, till the science of Eugenics is properly understood. And Eugenics is not going to be advanced by anarchy.

Meantime the noisy anarchistic Socialists lead the weak-minded section of the wage-earners by the nose, and so give a false idea of the numerical force of their section of the community. The loyal, steady worker is not a talker, or he might lead the second section instead of the anarchists doing so.

### AN EXAMPLE.

If there be any doubt about the truth of this argument, the following letter from a loyal aircraft worker should settle the point:—

"I am in the bad books of the other fellows owing to my refusal to down tools. This is the third time I have been placed in the same position. On three separate occasions have I worked when the others stopped. And the outcome of this boycott is what is worrying me, for I am threatened with being out of work when peace comes. As I have a large family, this is a serious problem.

"If there could be some guarantee that these loyal workers would not be sacrificed to the idol of Demos, I am sure a very large number of men would refuse to down tools, for my experience is that in strikes there is a large proportion of men who obey the mandate to down tools with bitter reluctance and only for fear of the consequences.

"I know I am by no means the only one who has loyally refused to obey the mandate to down tools. But I have seen that all those whom I have persuaded to refuse to obey the order have succumbed to the pressure exerted upon them, and have downed tools at the second occasion.

"It is impossible to adequately describe what a loyal worker has to endure at the hands of his fellow shop-mates, and when the treatment is continued month after month it has a very depressing effect, and is calculated to break even the strongest will, were it not that one is fortified by the thought that it is for your country! In spite of all, I am still prepared to refuse to obey the unpatriotic mandate of the often self-appointed 'labour mandarins.'"

### WHAT IT MEANS TO THE WORKMAN.

That being an example of what loyalty means to a man in a, presumably, badly misled shop, let us consider what disloyalty means in the end to the workman himself.



Our only war aim is to defeat Germany. Either we win this war, or Germany wins it. There can be no compromise peace, such as our politicians have envisaged, and such as we may hear openly advocated ere long if certain self-seeking politicians in official positions are not crushed soon enough.

Disloyalty to brothers, fathers, cousins, and uncles in the trenches by the men at the benches means, if it goes far enough, the defeat of the British Army in France. One does not believe that even the most disloyal man at the bench desires such a defeat and the wholesale slaughter of our Army, but every act of disloyalty in the workshop means so many more deaths in the field. It is purely a matter of how far disloyalty can go without causing a defeat.

Then let the disloyal workmen consider what defeat would mean for him. He probably pins his faith to all the political hog-wash which has been talked about universal brotherhood, the government of the people by the people for the people, and so forth. Our idiot press has told him nothing of the tyranny of anarchy, existing in Russia to-day, as but worse than it existed in France in 1790 and thereabouts. He cannot understand that, whatever happens, if there is to be a Government there must be a governing class. He knows that every workman is not fit to be a foreman or even a charge hand, yet he thinks that any workman can be a Cabinet Minister. Perhaps, judging from our samples, he is not to blame for thinking so.

But it will be well if the disloyal workman can be made to understand that the defeat of the Army means that he will thereafter be governed by Germans—and the German is a hard taskmaster.

#### WHAT SOCIALISM DID.

Germany is run by the military caste, which is why Germany is as strong as she is. The German military caste is also the German governing and political caste. This war was forced on, at least two years before Germany was ready for it, because, at the previous elections, the Socialist vote was so strong that it was evident that in a few years the Socialist Party would over-run Germany. Therefore, as the Austro-Russian squabble over the Servians offered an opportunity, the German military caste rushed into the war. The Socialists were run into the ranks, the democratic Bourgeoisie, being Officers of the Reserve, supplied the commissioned ranks of the line. Both were killed off in thousands. But the governing caste, in uniform, ran the war from administrative offices at home or from staff billets in the field, posts for which their highly specialised training suited them. Consequently the losses of the governing caste have been small, and so that caste is stronger in proportion in Germany to-day than ever it was.

France, on the other hand, relied largely on the remnants of her Old Nobility to lead her gallant armies in the field, and so lost vast numbers of her best. The Bourgeoisie ran the Government at home, and did it very fairly well on the whole. Though it never did so in a manner quite worthy of her heroic soldiers, her Government has consistently been better than ours.

In this country all our best and bravest went on active service at the start, and men who should be leading our armies to-day were killed as private soldiers in the first year of the war. Having no conscription, all the shirkers went into factories, where they now pose as skilled workers, and would rather see the country in a state of anarchy than allow themselves to be combed out and put into their proper places in the Army. And the worst of it is that these are the people for whom the rest of the misguided working classes are ready to strike, because they do the talking.

Is any workman such a fool as to think that any peace with an unbeaten Germany is going to weaken the German governing caste? Is it not evident that any peace to-day or any time, except a victorious peace, can only strengthen the hand of that caste?

#### THE ARMIES' NEEDS.

The Army in the Field must have men, as Sir Auckland Geddes has told the House of Commons. It has also been made known officially that the non-combatant arms are being combed out to fill the fighting ranks. And what is the result? Here is a pathetic letter from the wife of a corporal in the R.F.C. :—

"Knowing how interested you are in the air service, I should like to ask you if you don't think the men of that Corps are being treated rather unfair? In 1915 my husband, after offering himself at Whitehall, was asked to join the R.F.C. He has never had a black mark on his sheet, and gained two stripes and recommended for a third. Also passed out as first-class gas instructor.

"Now in his 40th year, him and hundreds of others are turned into the infantry. Some of those men have seven or eight children. We have only three, quite enough, too, to be left with. If these men are killed, what is to become of all these poor youngsters? Aren't there enough orphans already?

"England is saturated with young men under 30, who have no intention of joining unless they are compelled, and when they do are going in the Air Service. My own brothers are, if they have to join, and will get there simply because they can tell the tale and are Br, or something else.

"When my husband joined he had to pass fit in every way: Health, Education, and Trade. So while men of 40 with poor little helpless children are being trained for the trenches, these single ones with no one dependent on them are taking their places, or getting exemptions, just because they (the old men) are Ar.

"Can we expect good things from our men if they are not going to be treated justly? I should think there were heaps of men yet to be found, under, say, 30, without taking these of 40 with families, also stripping the Air Service of their best mechanics, those who have been there the longest. We are all anxious to win, but at least let us be fair."

There you have the view of a sensible patriotic woman. It is a trifle consoling to think that at the next election she will have a vote equal to that of any miserable shirker posing as a skilled workman, and will have a chance of voting for the candidate who demands justice and fair play for the Army. But, if any able-bodied young single man can read her letter and be content to remain in a safe comfortable job at home, then God help him for being such a worm in the shape of a man.

There are, it is true, certain workshop jobs that only strong men can do. Such jobs are easily differentiated from the multitudes of others on which young fit men are employed, when older men with families could do them as well or better. Those young fit men should be sent into the Army if we are to win the war, and not consent to a compromise peace which will strengthen the German governing caste. And if this country is so effete as to refuse to send these young men to fight for it, then in the name of common sense and of the welfare of humanity it must be conquered.

The country may be conquered by the British Army—that is to say the British working classes may come to their senses and be morally conquered by the patriotic spirit of the Army, and so be led to help it with men and material as it must be helped if it is to conquer Germany by force of arms. Or the country may be



conquered by Germany—and that depends entirely on whether the working classes do their duty or not. The Aristocracy and the Bourgeoisie have already done all that, and more than, the country had any right to expect of them. Either form of conquest would be better than the fate of the Gadarene swine.

#### AN ADDENDUM.

The great Mr. Dooley, in one of his classic conversations with his friend, has said: "Henessy! The anarchist is a man who does what he thinks God Almighty would do if He knew the facts."

There one has the whole mental attitude of the anarchist, the labour agitator, the revolutionist posing as a member of the Amalgamated Society of Engineers, and all those other people who are playing the traitor to the men in the trenches, summed up in one gorgeous sentence. Those few of them who are honest presume to usurp the place of the Almighty, and imagine themselves to be capable of stopping war with their idiotic doctrines, instead of obeying the natural law which decrees that war can only be stopped either by the victory of one side, or by mutual exhaustion.

The bulk of these traitorous agitators are, in fact, only out for themselves and for what they hope to grab when they have created a state of anarchy all over the world. To them I commend the latest move of that astonishingly clever German aristocrat, Baron von Kühlmann. Speaking in the Reichstag, as reported

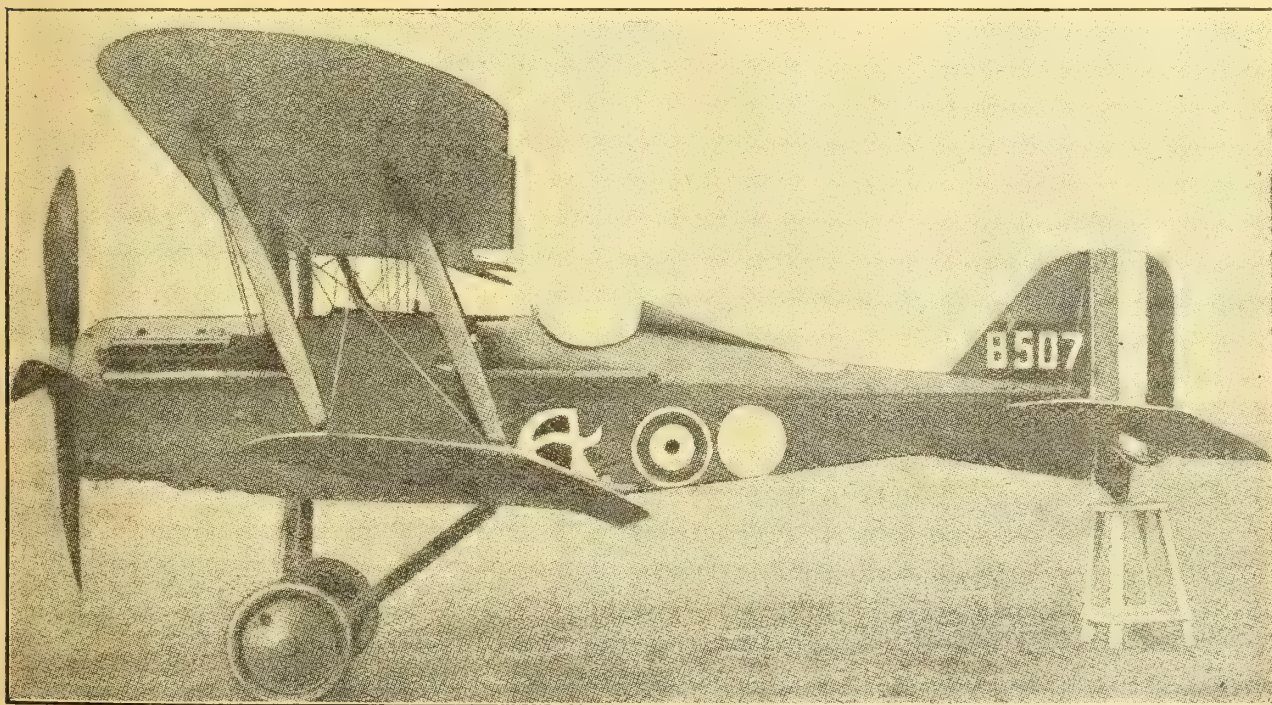
in the papers, on Monday last, he pointed out to the German people how democratic anarchy had brought Russia to ruin and starvation; how mob-rule (the government of *Demos*) is the worst tyranny under which man can suffer; how the government of Lenin and his friends is worse than that under the Czar; and how, if the German Government maintained itself by orderly force the Bolsheviks maintain themselves by brutal force. He pointed out to Poland and Alsace the benefits of being self-governing States as part of the German Empire, and set forth to the world generally the beauties of a well-organised Germany in contrast with mob-rule.

All the speech fits in absolutely with the foregoing sections of this article, which was written before Baron von Kühlmann's speech was made. Germany's policy is evidently to stir up the forces of anarchy among the Allied nations, and so to end the war. Then, when her enemies were thus broken up, the German politico-military aristocracy would step in and govern Europe, helped by the better class people of what are now the Allied countries, who would naturally prefer German government to mob-rule as exhibited in Russia to-day. It is for the work-people of England and France to make up their minds in the next few weeks whether they will see this war through to a finish, and back their natural leaders loyally, or whether they will progress through mob-rule, to defeat, and ultimately to government by Germany.—C. G. G.

## ON PARACHUTES AS LIFE-SAVERS.

From time to time casual reference has been made in this paper to the use of parachutes on aeroplanes. The capture of a German aeroplane fitted with a tube inside the fuselage for the housing of a parachute indicates that the Germans are thinking along the same lines as our own people. Therefore it seems worth while to discuss the question somewhat more fully than has hitherto been done.

In the first place, is it worth while to carry a parachute in an aeroplane on active service? In the old days, when war machines flew at 4,000 feet, there was obviously no chance of using a parachute, no matter how quickly it opened. If controls were shot away or stuck, or if a machine got into an uncontrollable spin or dive, or if it were set on fire, it would have been so near the ground by the time the aviator made up his mind to quit it,



**IN THE HANDS OF THE ENEMY.**—An S.E.5 Biplane (R.A.F. design), with Hispano-Suiza engine, captured apparently intact by the Germans. The photograph is reproduced from the German technical journal "Flugsport," which, like the French technical press—and unlike the British technical press—is well supplied with information about enemy machines.



that the parachute would have had no time to do its work before it hit the ground.

#### THE DIFFERENCE IN HEIGHT.

Now, however, things are very different. Fighting takes place, and most of the casualties occur, at anything between 10,000 and 20,000 feet. At such a height, if controls are shot away or jammed, the pilot has several thousand feet in which to fight with his machine before deciding that he cannot get it under control again. In modern machines uncontrollable spins do not occur, except through jamming or the shooting away of controls. In an uncontrolled spin from such a cause the machine descends more slowly than if it were diving under control. Therefore, with a properly fitted parachute, the pilot, and his passenger, if any, have a sporting chance of getting clear long before they reach the ground.

Even the chance of the parachutes becoming entangled in an uncontrollable descent is preferable to the certainty of being killed in the crash which is bound to happen if one stays in the machine. And such risk of entanglement can be reduced to a very long chance if the stowing and launching of the parachute be properly designed.

In the case of a man in a single-seater who is badly wounded and feels himself about to faint from loss of blood, it seems that it would be better for him to release himself in a parachute and trust to its slow descent, at some 15 feet per second, than to stick to his machine with the practical certainty of hitting something at about 100 feet per second, even if the machine is inherently stable and lands itself with its engine stopped.

#### THE FIRE DANGER.

Where fire in the air occurs, the parachute is obviously indicated as the only way to safety. In the old days, if a fire broke out at a height of 1,000 or 2,000 feet, the pilot had at any rate a long-odds chance of getting down safely before the machine was burnt to pieces. Many cases will occur to old-timers of such successful descents; for instance, that of the late Mr. Collyns Pizey at Lark Hill, that of the late Major Raleigh at Farnborough, and that of Mr. Dyke-Acland in France early in the war. Last year the late Serjt. Mottershead won a posthumous V.C. by saving his passenger's life at the expense of his own, in bringing his machine down on fire. He died of burns because the fire broke out too high up for him to get down before he was too badly burned to survive.

Against such cases any active-service aviator, and many at home, can mention others in which fire has broken out high up, and the crew of the machine has been burnt to death. In many cases, both our own and the enemy's, the pilot and, or, passenger has thrown himself overboard, preferring the painless fall and smash at the end of it to the long agony of a dive in the middle of a furnace. Such deaths could have been avoided in almost every case if the machines had been fitted with parachutes. It is better for a man to alight in Hunland by parachute than to be burnt to death in the air.

#### THE CARRYING QUESTION.

One of the chief objections advanced against parachutes is the difficulty of carrying them. In the German machine already mentioned there is a tube running from the back of the passenger's seat at an angle down to the bottom of the fuselage some feet away. This presupposes that the user will have time to pull the parachute out of the tube and launch it above him.

One imagines that the apparatus was not intended for emergency descents, but for experimental or other purposes. As, for example, such a purpose as was suggested by a gallant young friend of mine who proposed that when a machine was lost in the dark during a night

flight and was running short of petrol, the passenger, taking some firework flares with him, should get out with a parachute, find a suitable landing-place, and thence signal to the pilot where it was safe to land. He was quite grieved when his C.O. refused to sanction his trying the experiment himself.

However, it would not need a vast mental effort, or unusual ingenuity, to devise a method by which an adequate parachute could be stowed in the streamline fairing on top of the fuselage, behind the passenger's head in a two-seater, or behind the pilot in a single-seater. In a two-seater the parachute would have to be big enough to carry two men, which presents no difficulties.

#### A MATTER OF INGENUITY.

A little study and cleverness would make it possible to launch such a parachute upwards in such a way that it would pull the crew out of the machine, and thus avoid the chance of fouling the tail or wings if the crew had to drop overboard, as they do from a balloon-basket.

Starting with the brave Pégoud, a number of parachute drops have been done from aeroplanes, but, so far as one can learn, in all cases except his the aeroplane has been in control of a pilot after the passenger has left, so that there has been no danger of the machine fouling the parachute. Pégoud, however, demonstrated that it is safe to drop also from an uncontrolled machine, a fact with which his name deserves to be more honourably associated than even with his looping feats. He used an old-fashioned type of parachute, clumsy and heavy. The modern parachute is a much handier affair, lighter, and occupying far less space. In fact, it takes up less space than does a ship's life-buoy, whose purpose it is designed to fulfil in the air.

#### THE PSYCHOLOGICAL VALUE.

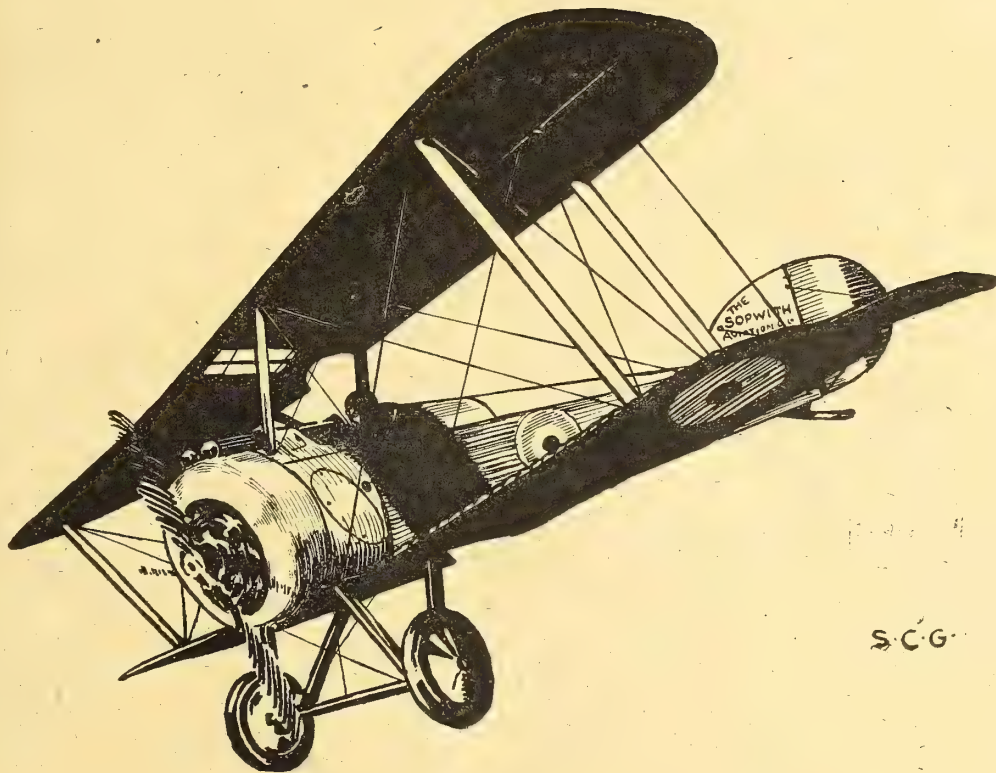
The whole question of life-saving parachutes on war aeroplanes is commended to the Air Force authorities as one deserving deeper consideration than it has hitherto received. Not merely has it great possibilities purely as a life saver, but it has considerable psychological value. Many brave men, who have no objection to being killed decently in a fight, have a horror of death by fire and of a long fall in an uncontrollable machine. They do their duty in spite of this fear, and they fly none the worse because of it. But one believes that this fear is ever present sub-consciously, and it must therefore have a continually wearing effect on their nerves, even though they do not admit it or even know it. The removal of this sub-conscious mental load would, one feels convinced, lead to a prolonged flying-life and to higher all-round efficiency, which would more than compensate for the slight extra load of the parachute on the aeroplane.

It would be interesting to have the opinions of practical aviators on this subject, not, of course, for publication or communication to anyone else, but as an indication as to whether the men who fly are in agreement with the views expressed in these notes.

A humorous friend has remarked that a man descending in a parachute always reminds him of a person who has been condemned to suicide with a strong recommendation to mercy. The epigram is apt. At any rate, suicide is sometimes preferable to execution, and the recommendation to mercy, in the case of the modern parachute, is so strong that in the great majority of cases where a parachute is used the Court of Appeal apparently sees fit to reverse the original verdict. One therefore suggests that far greater attention should be given to the use of parachutes in the future than has been the case hitherto.—C. G. G.



# THE SOPWITH



**AVIATION COMPANY, LIMITED**  
**KINGSTON-ON-THAMES, ENGLAND.**  

---

**CONTRACTORS TO H.M. GOVERNMENT.**

---

Telephone: KINGSTON 1988 (8 lines).  
Telegrams: SOPWITH, KINGSTON.



Paris Office:  
21, RUE DU MONT THABOR.



## SOME INSIDE HISTORY OF THE TANKS.

So much absolute nonsense has appeared in various papers on the subject of the origin of the tanks that it seems well to restate as clearly as possible the origin of these weapons. Unfortunately in wartime one cannot give the whole of their inside history, nor can one say all that one would like to say about the way in which the tank question has been mis-handled; but as all sorts of people, from Cabinet Ministers, up or down, to journalists, have seen fit to let themselves loose on the history of the tanks, it is only fair that some approximation to the real history should be published.

Credit for having originated the tanks has been very largely given to Major T. G. Hetherington, Hussars, R.F.C., R.N.A.S., and apparently Tank Corps, successively or concurrently. The credit for the tanks has also been given variously to Commodore Sueter, R.N., Wing Commander Briggs, R.N., Mr. Tennyson d'Eyncourt, Colonel Swinton, Colonel Stern, Admiral Tritton, Colonel Crompton, and various and sundry minor stars.

The one name which has never appeared in any official communication on the subject is the name of the actual originator of the present type of tank, the only type which has had even moderate success—Mr. R. F. Macfie—one of the pioneers of British aviation and at one time an officer in the Armoured Car Division R.N.A.S.

### A DISTINCTION AND A DIFFERENCE.

It is necessary to distinguish very clearly between what were once called land battleships, or landships, and armoured caterpillars, or "tanks." So far as the armoured caterpillar is concerned, I have personal knowledge that this idea as a means of breaking down wire entanglements, crossing and holding trench lines, and attacking enemy troops in the field, was definitely introduced to the Services by Mr. R. F. Macfie.

The date of Mr. Macfie's introduction of the idea can be fixed by the date of his commission in the Armoured Car Division R.N.A.S., for he showed me his general arrangement sketches for an armoured caterpillar while he was still a civilian, and before entering the King's Service. As a civilian he tried to get the idea taken up by various people, and he joined the armoured cars in all innocence with the mistaken idea that as an officer he would have a better opportunity of bringing his ideas to the right people than as a civilian. He had no intention of making a profit for himself out of the idea, but to benefit the country, and, therefore, he was prepared to get into uniform, where he knew he could make no profits out of the idea, in order to push the armoured caterpillar scheme through.

### DESIGN AND TACTICS.

Apparently about the time at which he joined the armoured cars, various and sundry people, including Colonel Crompton and Major Hetherington, were at work on the landship idea, but their designs and the tactical methods which it was then proposed to adopt were both impracticable, and the caterpillar mechanism

was not included in their scheme. On the other hand, Mr. Macfie's designs and tactical methods were to all intents and purposes identical with those actually employed when the tanks were first put in action at the Battle of the Somme in July, 1916. That is to say, twenty-one months after his designs and tactical schemes were submitted to his superior officers.

On joining the armoured cars Mr. Macfie came into contact with a number of officers who were subsequently associated with the tanks, and I am strongly under the impression that until his armoured caterpillar idea was introduced to that squadron no officer of that squadron had considered the use of the caterpillar mechanism, if indeed any of them were acquainted with such mechanism.

### THE FIRST APPRECIATION.

The officer commanding the Armoured Car Division at that period was Commander Boothby, R.N., and I am under the impression that Commander Boothby was the first officer to appreciate the mechanical and tactical possibilities of the Macfie armoured caterpillars. I am further under the impression that Commander Boothby was the first officer in a responsible position to introduce the said mechanism and tactical scheme to the Admiralty. Commander Boothby's name has not been mentioned in connection with the tanks, and the accuracy of the impressions stated above can be proved or disproved by any competent authority set up to get at the true history of the tanks.

So far as one can gather, Commander Boothby introduced the caterpillar scheme to Commodore Sueter, whose acute and receptive mind promptly appreciated the possibilities of the new weapon and probably saw its superiority over the so-called landships, with which seemingly futile experiments were being made.

Thereafter Commander Briggs, an R.N. engineer officer of proved cleverness, was called in to take a hand in the carrying out of the mechanical design. The subsequent history of the development of the tanks, in which the Naval Architect's Department, Colonel Swinton, Colonel Stern's Committee, and subsequent Committees were involved, is easily to be traced from official documents if necessary, but it is a clearly provable fact that the original landship designs were useless and that the armoured caterpillar and the tactical method of employing it did originate with Mr. R. F. Macfie, in that his scheme of 1914 was in all its essentials the scheme put into operation in 1916, after the failure of all other attempts.

It seems, therefore, that the prime credit should go to Mr. Macfie, and that the credit of recognising the value of his scheme should go to Commander Boothby and Commodore Sueter. Finally, I wish to make it perfectly clear that these notes are set down from a knowledge of the various events at the time in which they occurred, and that none of the three gentlemen whose names have been mentioned have any knowledge of their being written.—C. G. G.

## TO WOULD-BE PILOTS.

So many readers are constantly writing wanting to know how to become a pilot in the New Air Force that it seems well to point out that at the present moment the Air Force as such does not exist, though it may break out any day. Those who wish to become pilots in the R.F.C. should write to Room 29, The Air Ministry, Strand, W.C.2, and should give as many essential particulars about themselves as possible.

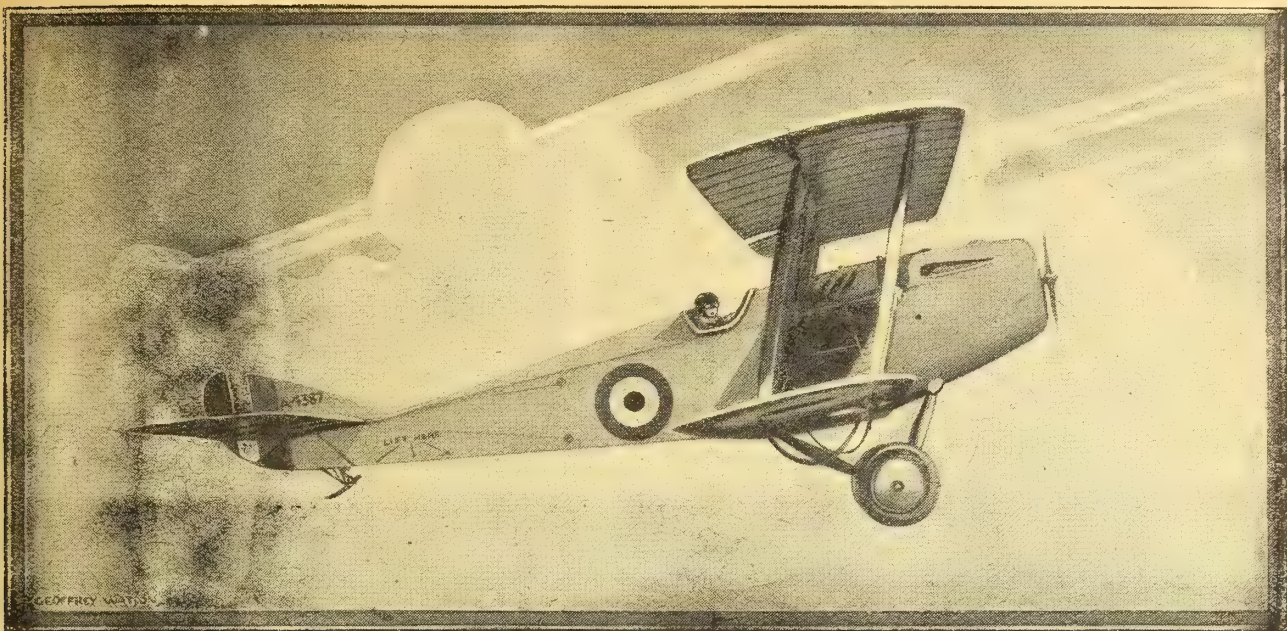
Among the particulars it is well to state the following:—Class of appointment desired in R.F.C., name in full, address, nationality of self and father, age, walking weight, schools, colleges, etc., at which educated, occupation in civil life, flying

experience, what sports indulged in and what proficiency, whether able to (1) drive car, (2) drive a motor-cycle, (3) ride, (4) sail a boat. Knowledge of (1) Lewis gun, (2) Morse, (3) map reading, (4) any special knowledge of petrol engines. *Military experience.* (1) Whether now serving, (2) regiment, corps or contingent. Whether medically examined for Military Service, and, if so, how classed. Technical experience. Any other qualifications

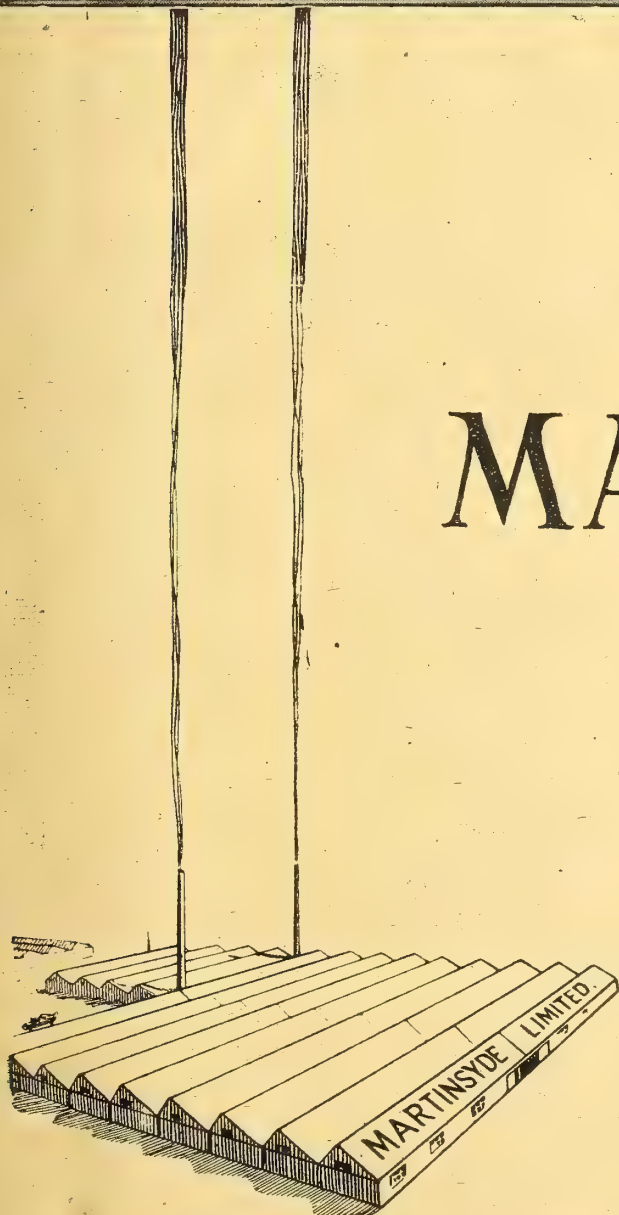
### AIRCRAFT IN THE HOUSE.

On Jan. 22nd, Mr. Macpherson, replying to Mr. Butcher (York, U.), said inquiries were being made as to the establishment of camps for prisoners of war in Germany in places particularly liable to air raids.





# MARTINSYDE



Aerodrome . and  
 Auxiliary Works:  
 BROOKLANDS.  
 Head Office  
 & Works :  
 WOKING , Surrey.



THE BRITISH & COLONIAL  
AEROPLANE CO., LIMITED

— FILTON, BRISTOL —

CONSTRUCTORS OF

*The "Bristol" Aeroplanes.*

— CONTRACTORS TO —  
H.M. AIR FORCES.

Telegrams :  
" AVIATION, BRISTOL. "



Telephones :  
3906 BRISTOL  
(Private Branch Exchange)



## Deductions from the World War: A Review.

BY HENRY FORESTER.

["Deductions from the World War." By Lieutenant-General Baron von Freytag-Loringhoven. (Constable & Co., Ltd. 1918. Pp. viii+176. 2s. 6d.)]

There exists a common delusion amongst those who have made no special study of the art of war that successful campaigns are the result of inborn genius on the part of the commanders, and of bravery and perseverance on the part of the victorious troops, and that the study of military history and of military philosophy does not contribute in any marked degree to the attainment of victory. There is a tendency to scoff at what is contemptuously termed "book knowledge" and to speak with praise of all that is the result of practical experience.

To some a Lord Mayor risen by his own devotion to business in all its intricacies, abstract and concrete, from the comfortable obscurity of a well-designed gutter to the troubled splendours of a Mansion House banquet in the days of peace is a greater potential leader of nations than is a modest duke descended from a race of statesmen. The business potentate, successful through many years in the fierce war of the sale-rooms or the sanding closet, is, we are assured by the daily dictators who give voice to the newsprints, more capable of controlling a great department of the War Office than the soldier who has devoted his life and his intellect to the study of his profession. And so through all public thought on military subjects, in so far as the British Empire is concerned. The man who has made most money earns most respect.

### MILITARY HISTORY.

The study of military subjects does not commend itself to the people. Military history, apart from that little which is interwoven prominently with the political history of the race, is a sealed book to all but the professional soldier and a few enthusiastic amateurs. The names of the great military writers proper to this country are unknown to the masses. The late Colonel Henderson, Sir Edward Hamley, Sir George Colley, Sir Frederick Maurice, Mr. John Fortescue, and others of the more modern writers on the art of war are unknown to the man in the street, who prefers such military information as comes his way to be enshrined in the persistent platitudes of Mr. Belloc or of the author of such works as the "Heroes of the V.C."

Military writers, however brilliant their mentality, however attractive their literary style, can never hope to attain the circulation of a moderately skilled manufacturer of fiction. Their voices are not heard by the people, and such influence as they have on the country is indirect in its effect, and of little endurance. The British nation consequently learns but little from such military failures as have on occasion marred its history.

### THE GERMAN HABIT.

In Germany, on the other hand, military science has never been ignored. Clausewitz is perhaps not a customary classic in the home of the labourer, nor is von der Goltz a favourite author of the drawing-room; nevertheless, such classes of the community as profess to be educated treat the art of war as of equal importance with other sciences and arts. Works on military philosophy and on the many-sided problems of war have a ready sale in the book-shops, and military writers of repute are widely known beyond the confines of the military profession.

It has therefore been possible in Germany, from this as much as any other reason, to make adequate preparation in the decades of peace for the inevitable wars that

are the milestones in a nation's progress. Not only is Germany from this reason a nation of potential soldiers even in times of peace, but she has been enabled to wage war at far less expense and with an infinitely smaller degree of waste in all things that are essential to national existence.

The means were at hand when war was declared for a rapid and vast expansion of the Germanic armies without a consequent dislocation of effort. Factories were available for the manufacture of munitions, and no great strain was put on such industries as are an essential part of the amenities of civil life. And so it was throughout all sections of the national endeavour.

### AN OBJECT-LESSON.

A short work which in some way indicates the truth of the above statements, published in Germany during 1917, was written by Lieutenant-General Baron von Freytag-Loringhoven, Deputy Chief of the General Staff. Widely read in Germany, three copies came to this country before the German censorship forbade its export. A translation has been made, and is now on sale at a low price for such as are interested in the art of war.

The book deals but little with actual operations in the war, the author giving most of his attention to the probable development of national military forces in the days to come. He directs himself to the elimination of such mistakes in military education and practice as have been revealed by the present war.

He is a devoted student of General Carl von Clausewitz, whose military theories have been proved true through every moment of the past three years.

The necessity for a major and a limited objective and of a swift change of intention from the greater to the less when the first concerted effort has failed has been proved. Also that victory in the fullest sense can only be attained by decisive victory in the field.

No war of attrition has yet succeeded in placing one combatant in the position of complete dominance over his foe, which is, after all, the single object of war.

### GERMANY'S PLANS.

There is little doubt that Germany intended by one supreme overwhelming attack to become predominant in Europe before the end of 1914, and to become completely victorious in months instead of years. Hence, as this first effort failed, her resources to some degree failed also, for no nation, however skilled in war, would ever in solemn truth prepare in peace for years of hostility.

Von Freytag-Loringhoven says "a complete German victory at the Marne in September, 1914, would have given quite another character to the whole war, and would certainly have shortened it very considerably. From this may be seen the full significance of a decisive military success, even in a war so influenced by world-economics as the present."

Such a victory would clearly have given to Germany all that she could desire. France overrun, England unready for a continuous effort, she could have dealt with Russia as she willed, and peace would have followed because of the very hopelessness of a continued struggle.

### THE SALVATION OF THE ALLIES.

But defeated on the Marne as she was—for to be held under such conditions is to be defeated—the whole aspect of the contest altered. Time was given the harassed Allies to prepare their resources for action, and, as von Freytag admits, the economic position of Germany at once became undeniably unpleasant, owing



to the sea power of Britain having time in which to take effect.

He draws the obvious conclusion that in future wars it will be necessary for a would-be victorious nation to make exhaustive economic arrangements to prevent internal dislocation should hostilities continue over long periods of time. Not only is it necessary that the armies in the field shall be efficient and brave, but it is essential that the nation at home shall be adequately organised in its warlike role.

#### THE NON-EXISTENT NON-COMBATANT.

Clausewitz said that in future there would be no non-combatants in a nation at war, and von der Goltz at a later date wrote of "a nation in arms." The war has proved them to be entirely right in their prophecy. War is no longer the affair of a highly skilled professional army and of the politicians who entangle nations in the meshes which the sword alone can unravel with certainty. The entire community, from the King in his isolated grandeur to the boy newsprint-seller who spreads the nightmare dreams of Fleet Street among a guileless people, is intimately involved in the international struggle.

Von Freytag traces briefly the growth of citizen armies, of national effort, from Napoleon, who towards the end of his reign drew on his people in a wider manner than had been done before in history, through von Moltke, who made every effort to form a vast army in 1870, to the present day, when it is an initial axiom of war that a nation's man-power and not the size of its professional army is the measure of its military effort.

#### SELF-EDUCATION IN SELF-PRESERVATION.

He lays down with dogmatic simplicity the necessity of inculcating a military spirit in the people as a means of national self-preservation in the fierce competition of the future. No longer can an army be maintained as a profession parallel with others in the country. The entire populace must be educated to a proper interest in national defence and in the maintenance of a citizen army recruited on the broadest scale and trained with such thoroughness as will ensure its being a perfect weapon of offence when necessity demands. He em-

phasises the need for an intelligent Press campaign in the interests of militarism.

[Vide Mr. Kipling's "Army of a Dream."—Ed.]

His theory is that by means of mass suggestion a nation will be induced to give adequate attention to armaments. "That men have always been susceptible to suggestion is demonstrated by the spread of religious fanaticism, but the present age has increased this susceptibility still further. Even distinguished minds are subject to mass suggestion, as is shown in the case of numerous distinguished scholars and artists among our enemies. Neither judgment nor good taste availed to prevent them from joining in the general orgies of hatred directed against everything German" [page 27].

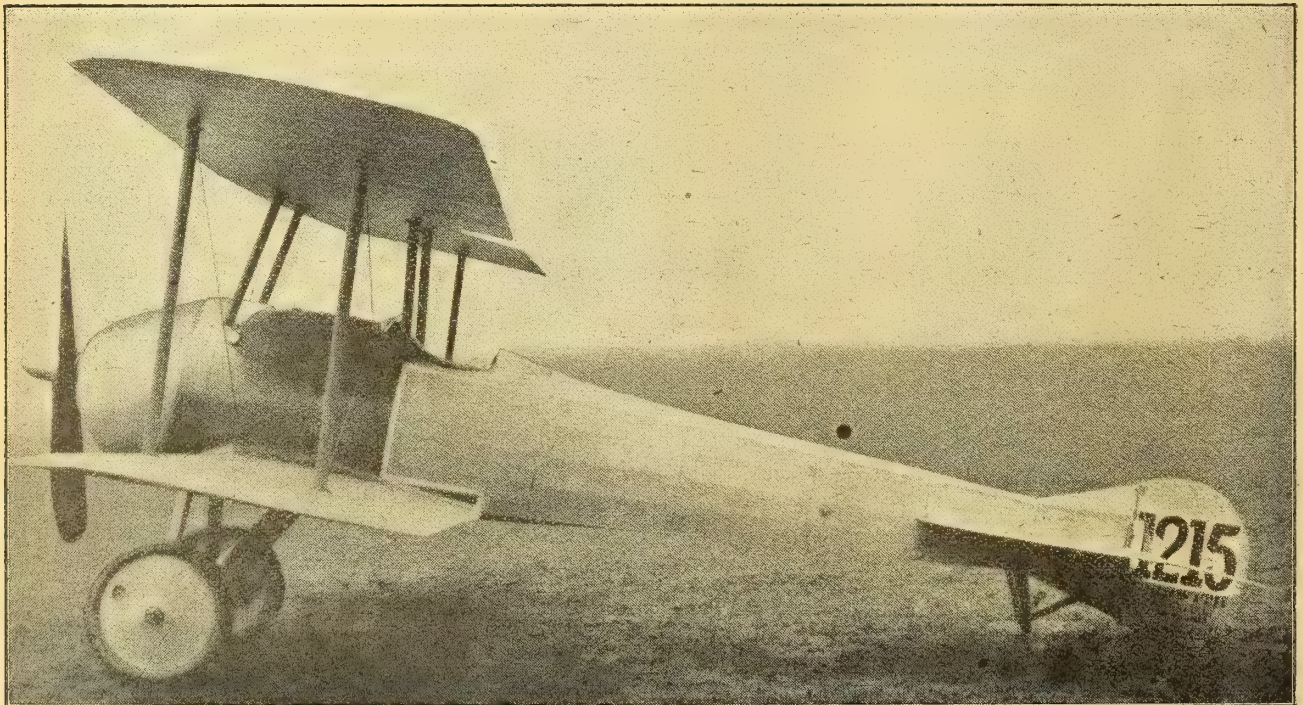
He is right in his last assertion, but he ignores the fact that the "mass suggestion" in that case was the general unpleasantness of the German character.

#### WHAT BELGIUM DID.

He implies that, had other nations behaved in sufficiently a circumspect manner, the present war need not have involved the civil population in its action. "As a result of the thoughtless adoption of franc-tireur methods of warfare in Belgium, with the support and approval of the authorities, the war acquired from the outset still more of the character of a struggle of nation against nation. The principle that war is directed only against the armed strength of the enemy-State and not against its population could not under these circumstances be upheld by our troops. They found themselves compelled to resort to severe measures of retaliation. Thus the war acquired a character of brutality which is otherwise very alien to the nature of our well-conducted German soldiers" [p. 27].

The truth is that, despite this apparently candid admission, no nation possessing any degree of military aptitude could seriously enter the war with the views of warfare and its detachment from the civil population common in the days of Louis XIV or of Frederick the Great. No unnecessary severity or cruelty against the civil population should be permitted, but measures are necessary to prevent breach of military rules by inhabitants of an occupied country.

(To be continued.)



The Sopwith Single-seater Biplane, with Gnome engine, built for the Gordon-Bennett Race of 1914, and taken over by the R.N.A.S. It was flown on active service by a Naval Officer till well on in 1916.





# ROLLS-ROYCE

*Contractors to H.M. Government.*

**ROLLS-ROYCE AERO ENGINES  
LIKE  
ROLLS-ROYCE CARS  
ARE  
THE BEST IN THE WORLD.**

**THE WORLD'S RECORDS ARE  
HELD BY ROLLS-ROYCE AERO ENGINES**

## CLIMBING

An aeroplane fitted with ROLLS-ROYCE engine holds the WORLD'S RECORD FOR RAPID CLIMBING.

## SPEED

An aeroplane fitted with ROLLS-ROYCE engine holds the WORLD'S RECORD FOR SPEED in the air.

## RELIABILITY

An aeroplane (Handley Page) fitted with ROLLS-ROYCE engines holds the WORLD'S RECORD FOR LONG DISTANCE FLIGHT under war conditions viz.: London to Constantinople.

## WEIGHT CARRYING

An Aeroplane (Handley Page) fitted with ROLLS-ROYCE engines holds the WORLD'S RECORD FOR WEIGHT CARRYING - viz.: London to Constantinople total weight SIX TONS

## PASSENGER CARRYING

An aeroplane (Handley Page) fitted with ROLLS-ROYCE engines holds the WORLD'S RECORD for carrying 22 PERSONS to a height of 7,000 FEET.

**ROLLS-ROYCE, Limited, 14 & 15, Conduit Street, London, W.1.**

Telegrams: Rollhead Reg., London.

Telephones: 1654 Gerrard (3 lines)

and at

Paris, New York, Petrograd Madrid, and Bombay



### THE AIR FORCE UNIFORM.

Without taking responsibility for the absolute accuracy of the following description one may say that the uniform which has at last been fixed for the Air Force is as follows:—

Jacket, khaki, cut on lines somewhat similar to the ordinary field-service jacket, but worn without a Sam Brown belt. The belt to be of khaki cloth, somewhat like that of an ordinary Norfolk jacket.

Trousers to be worn on parade, and on all occasions except when on duty with aircraft. Breeches and boots, or puttees, on such occasions.

Cap, khaki, built on model of Navy cap, with black band. Badge as R.N.A.S. but smaller, and rank stars to be worn on each side of cap-badge.

For the duration of the war the khaki uniform is to be worn, but one gathers that after the war a special cloth is to be woven, consisting of Russian gray cloth, with a 25 per cent. admixture of khaki thread, thus giving an effect somewhat similar to a "heather mixture" or a Lovat tweed. Probably it will eventually come out looking more like a workhouse shoddy or the fur of the common mouse.

Even without the enormity of the special cloth the uniform promises to look sufficiently bad. It is curious that just when French, Italian, and even American officers have taken to wearing the Sam Brown, unofficially, and just because it is the distinctive mark of an officer, our wise-acres of the Air Force should have decreed its abolition. A neatly cut jacket, like that worn by French and Italian officers, looks passable without a Sam Brown, but the cloth belt will give the effect of a cheap "sports suit," and, at a distance, it will probably seem that the Air Force officer has omitted to adjust his dress before leaving home. This comic tunic, worn with slacks, and the half-grown Navy cap appears to be about the sloppiest combination that could possibly have been evolved. One gathers that a committee of able-bodied officers has been sitting on this momentous question for many hours, spread over several months, and if this is the best effort they could evolve on such a simple matter one feels glad that they were not entrusted with any subject more directly concerned with the conduct of the war. It seems fairly evident that neither artistically nor practically are they possessed of the highest judgment, and, at any rate, this sumptuary occupation has perhaps kept them out of worse mischief.

One quite agrees with a certain distinguished officer who has laid it down that "dress is the lowest form of soldiering," and it is certainly not difficult to evolve a smart and serviceable uniform for any special purpose without wasting the time of a number of able-bodied people in producing the obviously wrong thing. After all this mental labour one suggests that the new gray-brown uniform should be known as the *ridiculus mus*.

With all its faults the old R.F.C. uniform tunic, cap, and breeches, can be made to look smart, and it certainly is serviceable and distinctive, so why not stick to it? That, presumably, did not suit the Naval members of the Uniform Committee, who had to work in the Naval cap, which in khaki looks more like a badly made cake which has overflowed its tin than any form of Service headgear. Then, as the bulk of the Air Force will have to work with the Army, why not stick to regular Army rank badges, which everyone knows, instead of inventing new stars and things which the soldier on the ground cannot recognise? There, again, one assumes that the Naval people objected to militarism, preferring to put rank badges on the cap and make the officers look like kinema janitors rather than like soldiers.

There are, one gathers, other egregious features about the costume—one shrinks from calling it a uniform—which will further endear it to its unfortunate wearers, but there is, at any rate, the consolation to those already in the Force, that they will be allowed to wear out their old uniforms before being compelled to buy new ones. Therefore, one foresees quite a rush of orders for R.N.A.S. and R.F.C. kit, so that officers may get enough in stock, before the new design is issued officially, to last them for the duration of the war. Officers of the real Navy and Army, who are merely attached Air Force, may, one understands, wear the uniform of their own Services. It seems probable that a good many will prefer to be attached rather than transfer altogether to the new Force.

The whole muddle is only another example of the inefficiency of officialdom as compared with the work of the civilian specialist. If the competent authority had gone to the great M. Comelli, or some other theatrical costumier of the first-class and had asked for designs for a uniform, with special injunctions to keep it quiet and gentlemanly, a dozen designs would have been submitted within two or three days, and the very worst of them would have been better than the official botched job. The result reminds one of a R.A.F. aeroplane: bits of everything stuck together without consideration of their agreement as a harmonious whole. However, doubtless, when the official enormity has been tackled by a really clever military

tailor, who knows how to depart from sealed patterns without doing so enough to get his customers into trouble, the Air Force uniform will become sufficiently wearable. But, one advises the young Air Force officer to go to the smartest tailor he can find, if he wants to avoid being a continual source of amusement to the senior Services.—C. G. C.

### A DISGRACEFUL EXHIBITION.

On Saturday, Jan. 26th, an incident took place which the Authorities would be very well advised to investigate; and severe measures should be taken against those responsible for its perpetration. Somewhere about 1.30 p.m. a small and apparently somewhat antiquated single-seater biplane was flown over the West End of London and subjected to a performance which would have merited censure had it occurred before a bank-holiday mob at a civilian aerodrome. So far as one was able to judge the exhibition was intended to give the greatest possible publicity to a Service wedding at St. James's Church, Piccadilly, but setting aside any question of good taste and the unwarrantable use of a Service machine, Service petrol and Service wages, the display was a distinct menace to human life and limb.

The irresponsible person who piloted the aeroplane continued to fly in small circles round the church for something in the nature of thirty minutes at an altitude varying between 300 and 800 ft. His flying was none of the best, some of the turns being exceptionally slovenly in their execution, but what made the performance little less than criminal was that his engine, an elderly rotary, besides misfiring from time to time, on more than one occasion stopped dead for several seconds when the machine was within a few hundred feet of crowded thoroughfares, and when the pilot was absolutely out of reach of a clear landing ground. No mentally balanced person would care to cross the city on duty at such an altitude as that at which this flight was made, but in view of the purely festive nature of the event, the whole display was quite unwarrantable, and such as to cause everyone in the vicinity who understands flying the gravest alarm, not for the safety of the aviator, of course, who could well be spared, but for the good name of the Air Force.

One trusts that the matter has already been dealt with locally so far as the offender's Squadron is concerned, but, in view of the very considerable amount of fool flying which is now taking place over crowded centres, because of the exceptionally flagrant nature of this particular incident the affair demands attention.

### AN EXHIBITION OF WAR RELICS.

All those who are interested in Naval and Military aviation should make a point of visiting the Imperial War Exhibition now being held at the Royal Academy Buildings, Piccadilly, W.1.

In addition to a priceless collection of photographs and relics relating to warfare generally, there is much of an aeronautical interest, including a captured Fokker monoplane, a Sopwith triplane, various famous British, French and German aeroplane and airship engines, representative collections of friendly and enemy bombs, specimens of aviators' clothing, including the electrically heated clothing of which a good deal has been heard lately. There is also a very interesting and comprehensive collection of various aeronautical instruments, such as portable wireless sets, aeroplane cameras, pressure indicators, air-speed indicators, and aeronautical navigating instruments generally.

There are, besides, examples of machine guns used in aeroplanes, and altogether one is able to get a much better view of aeronautical equipment at this Exhibition than is often possible.

The section devoted to photographs and examples of munition work, more particularly as it is done by women, includes a number of specimen aeronautical jobs produced in the wood-working, machine-tool, welding and tool-making shops.

The price of admission is one shilling, and the hours of admission are from 10 to 5 o'clock.

### THE INVASIONS OF ENGLAND.

On the night of Monday, Jan. 28th, the first air raid on London this year took place under conditions of brilliant moonlight. Two distinct attacks took place with an interval of nearly three hours between them.

So far as one is able to judge the system of officially organised shelters has done much to maintain public confidence, and the public generally apparently reviewed the raid in a spirit approaching philosophic calm.

It is satisfactory that at least one raider was accounted for.

If one may offer a suggestion to the competent authorities, it is that the air fighting might be arranged to take place over London, for the edification of the populace, while the work of the guns might be done in more rural areas. Thus there would be less damage done by shell splinters in London, and if an occasional raider fell on a house-top, the Defence Forces would be forgiven in return for the entertainment provided. Incidentally the massing of searchlights in London itself, to help the aeroplanes, would do good work in dazzling raiders and making it difficult for them to discover their location, even on the brightest moonlight nights.



# WESTLAND *Aircraft.*

WESTLAND AIRCRAFT WORKS.  
BRANCH OF PETTERS LIMTD,  
YEOVIL.

*Phone, Yeovil 141. Telegram Aircraft Yeovil.*

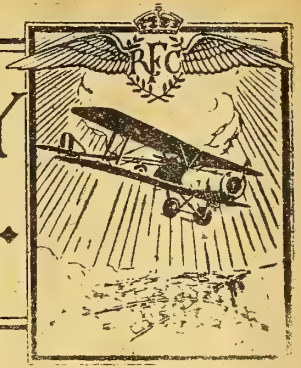


KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





# NAVAL *and* MILITARY • AERONAUTICS •



## FROM THE "LONDON GAZETTE."

ADMIRALTY, Jan. 19th.

JAN. 21st.—R.N.A.S.—To be Flt. Lt.:—K. B. S. Grieg, Nov. 26th, 1917.

JAN. 23rd.—R.N.A.S.—Flt. Comdr. to be Squad. Comdr.:—H. Res., Dec. 31st, 1917.

WAR OFFICE, Jan. 22nd.

REGULAR FORCES.—ESTABLISHMENTS.—Depot Comdr.—Temp. Capt. the Hon. W. C. W. Egerton, Gen. List, from an Adj., and to be temp. Lt.-Col. whilst so empld., Jan. 15th.

PARK COMDRS.—From Equipt. Officers, 1st Cl., and to be temp. Maj. whilst so empld.:—Sec. Lt. (temp. Capt.) W. D. L. Jupp, Spec. Res.; Sec. Lt. (temp. Capt.) T. Bullen, Som. L.I., Jan. 1st.

Equipt. Officer, 2nd Cl.—Capt. J. W. G. Mackinlay, Spec. Res., from a Staff Lt., Dec. 22nd, 1917, seny. from Dec. 14th, 1916.

WAR OFFICE, Jan. 23rd.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—MIL. WING.—Flt. Comdrs., from Flying Officers:—Temp. Capt. J. H. Storey, Gen. List, Dec. 30th, 1917. And to be temp. Capt. whilst so empld.:—Sec. Lt. (temp. Lt.) K. Shelton, E. Kent R., Spec. Res.; Temp. Sec. Lt. F. D. Grant, Gen. List, Jan. 4th. Sec. Lt. E. S. Meek, Spec. Res., Jan. 10th.

## CORRIGENDA TO "MENTIONS IN DISPATCHES."

The names of the following should read as now stated, and not as previously published:—

### BRITISH ARMIES IN FRANCE DISPATCHES.

Supplement to "Gazette," No. 30421, dated Dec. 11th, 1917.—Under R.F.C.—After Patten, Sec. Lt. (temp. Lt.) J. McD., R.F.C., Spec. Res., delete the word (killed).

### HOME FORCES.

Supplement to "Gazette" No. 30439, dated Dec. 20th, 1917.—Nicholson, Lt. (temp. Capt.) M., R.F.C.

WAR OFFICE, Jan. 24th.

REGULAR FORCES.—ESTABLISHMENTS.—SCHOOLS OF INSTRN. FOR R.H. AND R.F.A. (ANTI-AIRCRAFT).—Capt. R.A., to be Capt. Instrs. in Gunnery, and to be secd.:—M. D. W. E. B. Levien, T.F., Oct. 10th, 1917. H. R. Kilner, Dec. 30th, 1917.

MEMORANDUM.—Capt. C. L. Stewart, Canadian Exped. Force, to be Adj. of a Cdt. Wing, R.F.C., Oct. 1st, 1917.

WAR OFFICE, Jan. 25th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—MIL. WING.—Flt. Comdrs.—From Flying Officers, and to be temp. Capt. whilst so empld.:—Sec. Lt. H. Munden, Som. L.I.; Sec. Lt. J. B. Crompton, Spec. Res., Jan. 4th; Temp. Sec. Lt. N. V. Harrison, Gen. List, Jan. 7th. The appt. of Capt. N. H. Bottomley, E. York. R., Spec. Res., notified in "Gazette" of Sept. 10th, 1917, is antedated to March 22nd, 1917.

Experimental Officer, 1st Cl. (graded as an Equipt. Officer, 1st Cl.).—Sec. Lt. (temp. Capt.) C. Porri, Yeo., T.F., from an Equipt. Officer, 1st Cl., to be secd., and to retain his temp. rank while so empld., Aug. 11th, 1917.

SCHOOLS OF INSTRN.—SCHOOLS OF AERIAL GUNNERY.—Chief Instr. (graded as a Park Comdr.).—Lt. (temp. Capt.) J. W. Gordon, Spec. Res., from an Instr. in Gunnery (graded as an Equipt. Officer, 1st Cl.), Armament School, and to be temp. Maj. while so empld., Dec. 12th, 1917.

ARMAMENT SCHOOL.—Asst. Instr. in Gunnery (graded as an Equipt. Officer, 2nd Cl.).—Capt. P. S. Jackson-Taylor, Herts R., T.F., from an Asst. Instr. in Gunnery (graded as an Equip. Officer, 3rd Cl.), Nov. 21st, 1917.

GEN. LIST.—Capt. J. H. Jackson, ret., to be temp. Lt., May 3rd, 1917, and to be temp. Capt. (without the pay or allowances of that rank) from Jan. 1st.

WAR OFFICE, Jan. 26th.

REGULAR FORCES.—STAFF.—ATTD. TO HDQR. UNITS.—Camp Comdt.—The rank of Sec. Lt. T. J. Hudson, R.F.C., is as now described, and not as in the "Gazette" of Dec. 3rd, 1917.

ESTABLISHMENTS.—R.F.C.—MIL. WING.—Staff Officers, 3rd Cl.

(graded as Staff Capt.).—Lt. (temp. Capt.) T. M. Eggar, Lond. R., T.F., from an Adj., R.F.C., and to retain his temp. rank while so empld., vice Capt. R. Addenbrooke-Prout, Gen. List, Dec. 28th, 1917. Lt. T. Fawdry, N. Lan. R., to be secd., and to be temp. Capt. while so empld., Jan. 1st.

Wing Comdrs.—Capt. (temp. Maj.) Lord G. Wellesley, G. Gds., from a Sqdn. Comdr., and to be temp. Lt.-Col. while so empld., Oct. 1st, 1917. Maj. (temp. Lt.-Col.) J. H. A. Landon, D.S.O., Essex R., T.F., from an Asst. Dir. at the War Office, and to retain his temp. rank while so empld., Dec. 27th, 1917, seny. Aug. 13th, 1917. Lt. (temp. Maj.) J. E. A. Baldwin, Hrs., from a Sqdn. Comdr., and to be temp. Lt.-Col. while so empld., Dec. 28th, 1917.

Flt. Comdrs.—From Flying Officers, and to be temp. Capt. while so empld.:—Lt. F. A. V. Cook, Durh. L.I., T.F., Jan. 6th. Lt. W. B. Farrington, Notts and Derby R., Spec. Res., Jan. 10th.

Adj. Temp. Lt. (temp. Capt.) J. H. Jackson, Gen. List, Jan. 1st.

Equipt. Officers, 1st Cl.—Maj. L. N. G. Filon, T.F. Res., Dec. 28th, 1917. From the 2nd Cl., and to be temp. Capt. while so empld.:—Sec. Lt. (temp. Lt.) P. G. Emery, Spec. Res.; Temp. Lt. E. Drudge, Gen. List; Sec. Lt. (temp. Lt.) F. H. Tyas, Spec. Res.; Sec. Lt. (temp. Lt.) R. H. Grant, Spec. Res.; Sec. Lt. (temp. Lt.) D. H. Kemp, Spec. Res., Jan. 1st.

SCHOOLS OF INSTRN.—SCHOOLS OF MIL. AERONAUTICS.—Examining Officer (graded as an Equipt. Officer, 2nd Cl.).—Temp. Sec. Lt. J. Morris, Gen. List; an Equipt. Officer, 3rd Cl. and to be temp. Lt. whilst so empld., Nov. 5th, 1917.

GEN. LIST.—Sert. H. Dean, from R.F.C., to be temp. Sec. Lt., Jan. 12th.

\* \* \*

The following are extracts from a dispatch dated Dec. 16th from General Allenby, Commanding-in-Chief the Egyptian Expeditionary Force, describing the operations culminating in the capture of Jerusalem.

During Nov. 6th a certain amount of movement on the roads north of Gaza was observed by our aviators and fired on by our heavy artillery, but nothing indicating a general retirement from Gaza.

13th.—During the 8th the advance was continued, and it soon became obvious from the reports of the Royal Flying Corps, who throughout the 7th and 8th attacked the retreating columns with bombs and machine-gun fire, and from other evidence, that the enemy was retiring in considerable disorganisation, and could offer no very serious resistance if pressed with determination.

Operations on the 10th and 11th showed a stiffening of the enemy's resistance on the general line of the Wadi Sukereir, with centre about El Kustineh. Royal Flying Corps reports indicated the total hostile forces opposed to us on this line at about 15,000; and this increased resistance, coupled with the capture of prisoners from almost every unit of the Turkish force, tended to show that we were no longer opposed to rearguards, but that all the remainder of the Turkish Army which could be induced to fight was making a last effort to arrest our pursuit south of the important Junction Station.

By the evening of the 15th the mounted troops had occupied Ramleh and Ludd, and had pushed patrols to within a short distance of Jaffa. At Ludd 300 prisoners were taken, and five destroyed aeroplanes.

Jaffa was occupied without opposition on the evening of the 16th.

17th.—The situation was now as follows:—

The enemy's army, cut in two by our capture of Junction Station, had retired partly east into the mountains towards Jerusalem and partly north along the plain. The nearest line on which these two portions could reunite was the line Tul Keram-Nablus. Reports from the Royal Flying Corps indicated that it was the probable intention of the enemy to evacuate Jerusalem and withdraw to reorganise on this line.

(Continued on page 513.)



# AIRCRAFT MANUFACTURING COMPANY———LIMITED

Contractors to  
War Office and Admiralty

London Office

27, BUCKINGHAM GATE, S.W.1.

Offices & Works

HENDON, N.W.9.



# GNÔME & LE RHONE ENGINE COMPANY

**Contractors to the  
War Office and Admiralty**

**London Offices :**

**27, BUCKINGHAM GATE, S.W.1., and THE HYDE, HENDON, N.W.9.**

**Works: Blackhorse Lane, Walthamstow.**



**WOODSIDE ENGINEERING COMPANY, LTD.,  
POSSILPARK, GLASGOW.**

---

# **AEROPLANE TIERODS**

**: IN :**

**STREAMLINE AND ROUND SECTIONS**

**COMPLETE WITH**

**UNIVERSAL OR FORK JOINTS**

**LARGE STOCKS.**

---

**PROMPT DELIVERY.**

---

**Telephones.**

**WORKS: 1495 Douglas (2 lines.)**

**OFFICE: 3456 Central (3 lines.)**

**(Private Branch Exchange.)**

**Telegrams: "FUSELAGE," GLASGOW.**

**Registered Office**

**50 WELLINGTON STREET,  
GLASGOW.**



“ “ **CONTRACTORS TO “ “**  
**HIS MAJESTY'S WAR OFFICE**

*Messrs. Gordon Watney & Co. Ltd*

**AERONAUTICAL AND  
GENERAL ENGINEERS**

**South Lodge Motor Factory**

**WEYBRIDGE**



**Telephones WEYBRIDGE 550 (7 lines),      Telegrams: "MERCEDES, WEYBRIDGE."**



# AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER

## The British Aircraft Industry.

(SECOND SERIES.)

BY R. P. HEARNE.

### IV.—THE AIRCRAFT SUPPLIES CO., LTD.

"What a good idea!" I said to myself, a few years back, when I heard that a company had been formed to deal specially in aircraft supplies. As everyone connected with the new industry knows, there was very great need for a central supply system, a kind of commercial clearing house, where one could quickly obtain supplies of the numerous items connected with aircraft building.

To Mr. George H. Mansfield belongs the credit of being the pioneer in this new department, and events have shown that he was just the man for the job. Yet, as in so many cases of men finding the door to Success, it was quite by accident that Mr. Mansfield took up this work. Of course, I know that he would have made good in other directions, but he could have hardly scored a bigger success than he has done in organising aircraft supplies.

#### A DIFFICULT JOB.

It is well that the reader should have a fair idea of the difficulty of the work as well as the need for it, and then he will the better appreciate what Mr. Mansfield has accomplished. For years before the war the British Aircraft Industry had been so badly neglected by the authorities that it was impoverished and disorganised. It hung together more by enthusiasm than by anything else. Really, it was little more than a series of workshops where experimental work went on in a small way, in the hope that one day large orders would come to hand.

Each firm was steeped in individuality, even to the smallest details, and as a result there was a great and largely an unnecessary diversity in designs of parts and fittings, and an enormous multiplicity in the number of sizes and patterns. This confusion exists in every new industry, and it lingers until the industry finds its feet. The only way an industry can find its feet is by getting profitable business over a term of years.

When the war came, and there was a sudden demand for aircraft in big numbers, the confusion over supplies became acute, and then Mr. Mansfield rose to the occasion. Firms were at their wits' ends to obtain what they wanted, and it was through the problem of a manufacturer requiring a certain little item quickly that Mr. Mansfield got his first chance.

Quite by accident he was asked if he knew where the article could be obtained. He knew. He was entrusted with the task of getting it. . . . And he delivered the goods.

#### CATCHING THE TIDE.

He was quick to see that the industry needed more help in this direction, and seizing his opportunity he successfully carried out further commissions, until he made himself indispensable to the industry.

That stage was not slow in being reached, for one firm after another was brought to realise the utility of having a central supply house for their requirements.

Mr. Mansfield opened up business first in his father's residence, John Street, London, W.C., in July, 1915, on a very modest scale, and to understand why he made such rapid progress we must glance at his work before this time.

Since the year 1910 he had been associated with the London Aerodrome in various capacities, from secretary to assistant works manager of the Grahame-White Aviation Co. He could not had more valuable experience.

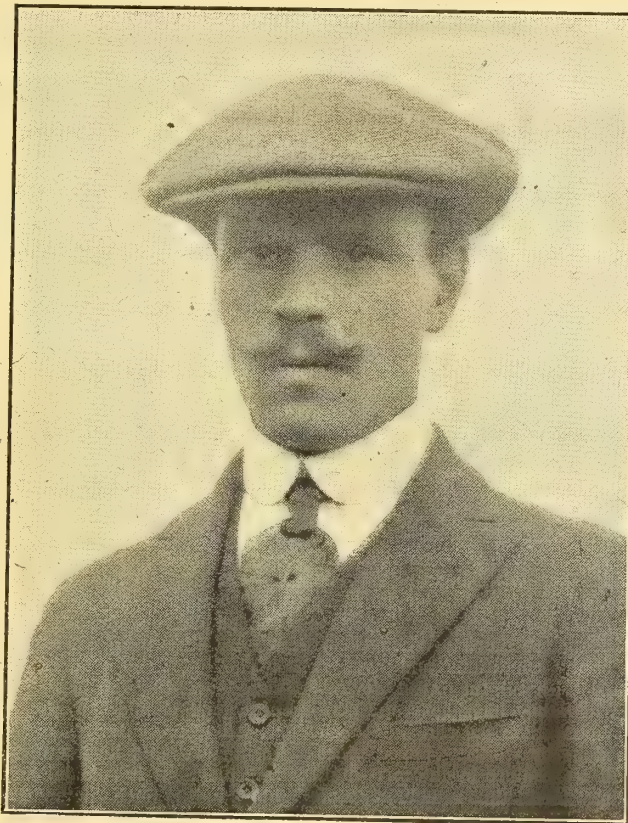
Although not trained as an engineer, Mr. Mansfield has an aptitude for this work, and he had unique facilities for learning all about aeroplanes both on the flying ground and in the factory. Coupled with this he had received a good training in accountancy, and thus he developed the business ability which so many engineers lack.

#### THE TEACHING OF EXPERIENCE.

With this very rare experience Mr. Mansfield was peculiarly well qualified to make the new business go. He had a good working knowledge of aircraft engineering. He knew the production as well as the testing side of the industry, and a

remarkable retentive memory enabled him to bear in mind where the right men and the right stuff were to be found for the many requirements of the new industry.

It must be remembered that when the Government woke up in 1914 to the necessity of ordering more aeroplanes there was general confusion. As orders and output developed and many new firms came in the confusion became greater. An aeroplane is built up of an amazing number of little parts, which must be collected from many sources. An enormous amount of time was wasted in hunting round for supplies of this or that article, and



Mr. George H. Mansfield.



with the multiplicity of designs and patterns the confusion became worse confounded.

#### A CLEARING HOUSE.

Mr. Mansfield first of all specialised in finding out supplies, and then he developed to collecting and holding in readiness the many articles which his experience told him were required. So highly has he perfected his system now that if a manufacturer supplies him with a copy of a contract the firm will receive by return of post quotations of the prices and quantities of the various parts relating to that contract which the Aircraft Supplies Co. hold in stock. Thus from that stock the manufacturer will be able to draw a number of items, the collection of which from individual firms would be a most laborious and tedious process.

In himself Mr. Mansfield is quite a clearing house of information on aircraft supplies, and as a broad-minded business man he makes it a point of helping where possible a firm to get in touch with supplies and information which are outside his business. The Aircraft Supplies Co. find their hands full in dealing with metal parts mainly, and one has only to go through their stock-rooms to note the amazing number of different parts and designs which must be stocked. We may expect further development as the industry grows.

#### THE WORKS.

In 1916 Mr. Mansfield found it necessary to start works of his own near John Street, W.C., in order to supplement the available supplies of special parts, and, oddly enough, after taking the works he discovered that the premises had been owned many years ago by his grandfather.

One of the outstanding features of the Ascol Company (as the Aircraft Supplies Company is now generally called) is the enterprising method by which they keep clients in touch with the market. This work brought Mr. Bernard Isaac into collaboration with Mr. Mansfield, and the result has been very satisfactory.

#### MR. BERNARD ISAAC.

Mr. Bernard Isaac really deserves an article all to himself. I first met him many years ago in the very beginning of the aircraft movement, and I was much struck by his organising powers.

Even then he had produced a most wonderful catalogue of information, designed to be of great help to people interested in aviation. The work never received the appreciation it deserved, but it is pleasing to find that the new "A.G.S. Book," compiled by Mr. Isaac, and produced by the Aircraft Supplies Co., is in wide demand by the Industry and the Services.

It is really a marvellous bit of work, for it forms a clear and precise index to practically every component of the aeroplane. Not content with this book the Ascol Company issue a fortnightly house journal styled "Aircraft Supplies." This is sent free to responsible officials in the Services and the Trade. It sets forth the quantities and prices of the principal articles in stock, and, in addition, there is a considerable amount of useful information on various subjects of interest.

In order to keep clients posted with regard to special stocks arriving during the interval between the issues of the house journal, a Special Stock Letter is issued on alternate weeks.

By this very thorough system the industry is kept in constant touch with the supplies of the many indispensable parts which would be so troublesome to collect by other methods.

#### THE LATEST MOVE.

The Aircraft Supplies Company has recently moved into new headquarters at Ascol House, 125, Long Acre, W.C. Not so long ago the place was a night club, and the underground dancing hall is now a great storeroom of more useful units. The platform from which the coon band ejected its rag-time rancidities is now the storekeeper's office, and he looks out on an orderly array of over a thousand items, many of which are destined to enter the dance of death one day as parts of aeroplanes circling over German guns!

And in the corner of the storeroom I found an historic pile of fabric used for wrapping up packages. The fabric is stripped from the frame of "dead" aeroplanes brought down in Flanders. You could see bullet and shrapnel marks in many parts of the stuff. What a romance could be woven out of that soiled and torn heap of battle-scarred linen! It only shows how true economy and efficiency set small store by sentiment when it is out to win a war.

## The Future.

BY A. V. ROE.

Is it possible to have a peep into the future? At any rate, we can try and form some conclusions. Rapid strides are bound to take place in all directions, but some may question the necessity of making rapid strides; why not be satisfied with things as they are? "What was good enough for my grandfather is good enough for me," used to be proudly proclaimed by some wiseacres. Then we used to hear of the "good olde days."

Facts speak for themselves; as the world gets older its people go on accumulating knowledge in medicine, science, etc., etc., handing it down from generation to generation. There are ups and downs, there are pros and cons, but the net result is a constantly improving standard of living.

Therefore, it will not be the minority who will enjoy comfortable homes and surroundings and the means to bring up a family as they should be brought up. There will be a gradual swelling of what one might call "the well-to-do" classes, but the rate of expansion, to a great extent, depends on the workers themselves.

If the people wish to share in the good things of the world they must help to produce them. It is no use to restrict output or employ inefficient methods, and allow other countries to do our work and to hand them our gold as we have done in the past; that means poverty and unemployment.

We never need be afraid of producing too much. When everybody works under pleasant and healthy conditions and lives in magnificent towns and homes fitted with all the latest devices, labour-saving and otherwise, and when they have easy and comfortable means of conveyance, etc., etc., then we can talk about restricting output, but that will be done by working fewer hours.

When we find we can produce all we require in the forty-eight hour week it will be cut down to, say forty, thus enabling people to spend more time in educational and sporting hobbies. Street loafing and standing at corners will become rarer and rarer as the people gradually learn to appreciate the many more interesting ways of spending their leisure hours.

Lack of imagination and plain common-sense thinking has held this country back and is still doing so. There is a good deal in the saying, "The vision of things to be done may come a long time before the way of doing them appears clear, but woe to him who distrusts the vision."

However, there is little use in only criticising. Now, what is the remedy? The remedy lies with the people themselves. Surely more than half the people are capable of thinking and judging soundly. At any rate, it is a well-known fact that there are only a small percentage of dishonest people, otherwise such places and similar businesses as the New Royalty Restaurant, by the Town Hall, Manchester, could not be run. There one helps oneself and pays at the desk on leaving.

Therefore, in the heart of the people there must be a feeling

and a desire for fair play, so why not let "Fair Play" be your motto and go straight for the right and obvious thing?

Some agitators argue there is an uneven distribution of the rewards of industry; but is this so? Again, there are pros and cons. The more business a firm does, the more money it has to find in order to carry on the increased business.

There are good employers and bad, in the same way as employed; but on the law of averages we may safely assume the good and well-meaning are in the majority. A good employer does not work with the idea of only enriching himself, but likes to succeed for progress' sake, which benefits everybody.

The politician must put his country's interests before his party. The employer must always carry on his business with the view of serving his country; and the employed must put their country's interest before their union, unless they are thinking of settling down in Germany after the war.

For instance, if in America a bricklayer lays 2,000 bricks a day and the British bricklayer's union will not allow him to lay more than a thousand, who is the gainer? Nobody. It is an all-round loss to the bricklayer, the employer, and the public. It means that you have to pay higher rents, and when this method is carried on right through the whole industrial life it means that we are all cutting each other's throats.

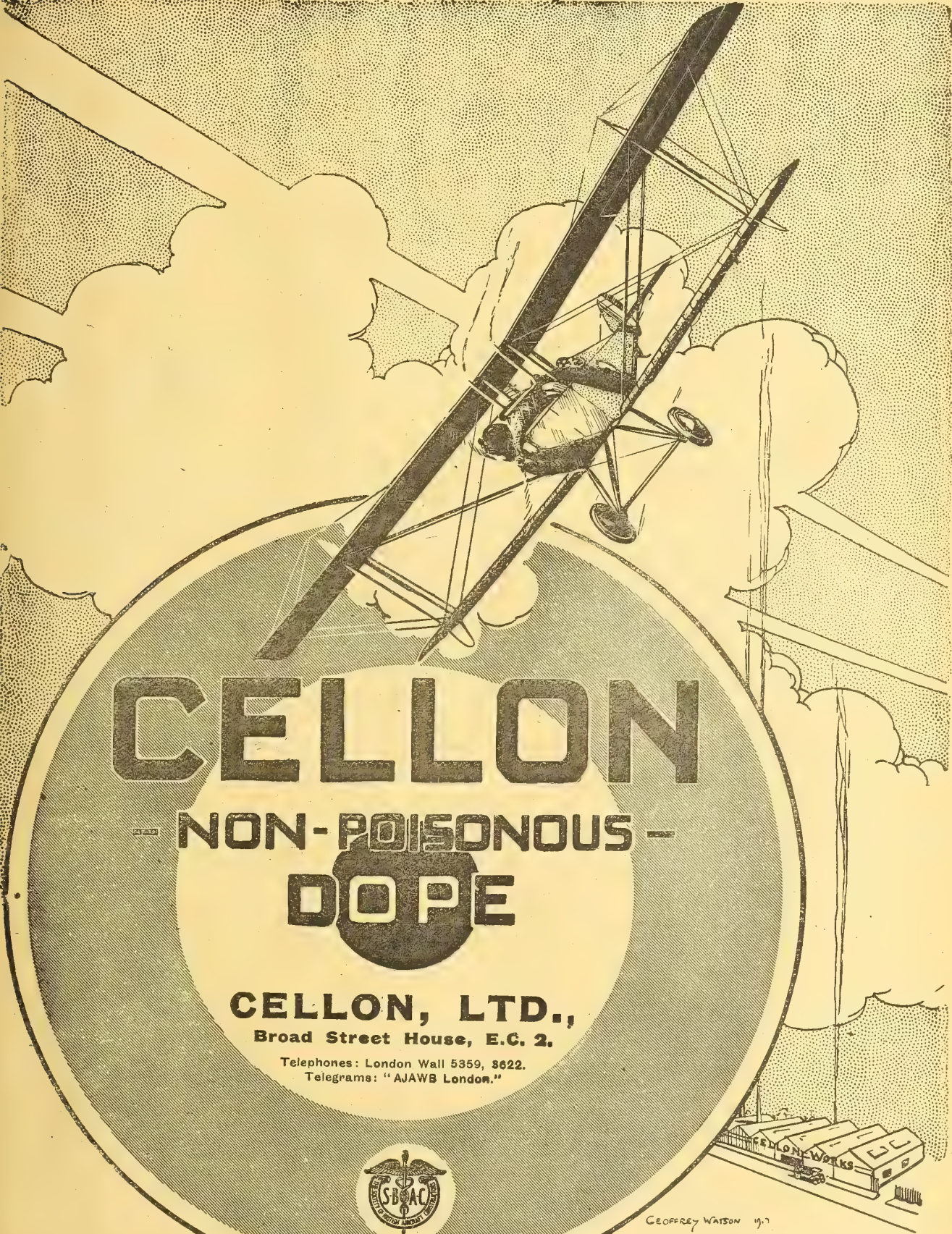
The industrial workers should first satisfy themselves of the soundness and fairness of a movement before giving their support, and should they honestly at heart feel it is not fair, then as true representatives of the British Empire and what it stands for they should keep out: to strike while there is a war is not fair play. It is suicidal and indescribably mean; it is a form of blackmail. Such methods cannot win in the end.

Now let us presume for argument's sake there is a majority for "fair play"; then all that is necessary is for the people to get their chosen Parliamentary members (I will not use the word politician) or their unions to represent their real views. The way to obtain the right type of leaders is to support patriotic non-party men and patriotic organisations.

Why is the world in such a turmoil? Is it the result of ignorance and distrust? When there is a universal desire for "fair play," and when the people act up to it, they will find there is room for all: there will be no wars; industry and life will be more pleasant. Meanwhile, in order to bring the minority into line, the existing machinery for forcing "fair play" must continue to be strengthened, as voluntarism alone is useless.

Although there is ample room for improvement, there is no other country in the world where one can get better justice than in England. In order to help on this great ideal of "fair play" we Britishers must still take a greater interest in the welfare of our country and the way it is controlled.





# CELLON

— NON-POISONOUS —

## DOPE

**CELLON, LTD.,**  
Broad Street House, E.C. 2.

Telephones: London Wall 5359, 8622.  
Telegrams: "AJAWB London."



GEORGEY WATSON 1917



**INTERNATIONAL AIRCRAFT STANDARD.***Adopted by the International Aircraft Standards Board.*

The International Aircraft Standards Board, of the Advisory Commission of the Council of National Defence of the U.S.A., has formulated the following specifications.

**SPECIFICATION FOR ALLOY STEEL TUBES.**

**GENERAL.**—1. The general specifications 1G1 shall form, according to their applicability, a part of these specifications.

**USE.**—2. These tubes are suitable for axles and parts subject to shock.

**MATERIAL.**—3. The material for these tubes shall be chosen from the I.A.S.B. standard steels listed below. The composition chosen shall be stated by the manufacturer and is further limited as follows: Carbon, not over 0.35 per cent.

**MANUFACTURE.**—4. (a) The tubes are to be of the cold-drawn, seamless type. To avoid overhardening after annealing the tube wall shall not be reduced more than 20 per cent. in thickness in the final passes.

**HEAT TREATMENT.**—(b) The tubes shall be heat treated to temper 1 or 2 as ordered. The quenching is to be done in oil.

(c) Any tube may be rejected at any time because of injurious defects or faults in the steel which are revealed by manufacturing operations, notwithstanding the fact that it has previously passed inspection. Such rejected material shall be returned to the manufacturer at the latter's expense. This clause shall not apply to materials fabricated after export.

**WORKMANSHIP AND FINISH.**—5. The tubes are to be smooth, of the section specified, and within the permissible tolerances as to wall thickness, of uniform diameter, free from scale, dirt, specks, longitudinal seaming, lamination, grooving, and blistering, both internally and externally.

**PHYSICAL PROPERTIES AND TESTS.**—6. The tubes shall have the following physical properties:

**TENSILE TEST.**—(a).

**TEMPER 1.**

Minimum tensile strength, 110,000 pounds per square inch (77.33 kg./mm.<sup>2</sup>).

Minimum yield point, 90,000 pounds per square inch (63.27 kg./mm.<sup>2</sup>).

Minimum elongation, 15 per cent. in 2 inches (50.8 mm.) or 5 per cent. in 8 inches (203.2 mm.).

**TEMPER II.**

Minimum ultimate strength, 85,000 pounds per square inch (59.76 kg./mm.<sup>2</sup>).

Minimum yield point, 60,000 pounds per square inch (42.18 kg./mm.<sup>2</sup>).

Minimum elongation, 25 per cent. in 2 inches (50.8 mm.) or 10 per cent. in 8 inches (203.2 mm.).

**CRUSHING TEST.**—(b) The test specimen shall be crushed endwise until the outside diameter is increased in one zone by 25 per cent., or until one complete fold is formed. The specimen must stand this treatment without cracking.

**SELECTION OF TEST SPECIMENS.**—7. One test specimen for the tensile test shall be chosen from every 400 feet (121.9 m.) of tubing and one test specimen for the crushing test from every 100 feet (30.5 m.) of tubing.

The specimens for the crushing tests shall have a length of 1.5 times the diameter of the tube.

Whenever possible the selection of test specimens shall be made by heats.

**DIMENSIONS AND TOLERANCES.**—8. (a) The following tolerances will be allowed on the outside diameter of tubes:

Tubes under 1.5 inches (38.1 mm.) diameter,  $\pm 0.003$  inch (0.08 mm.).

Tubes over 1.5 inches (38.1 mm.) diameter,  $\pm 0.005$  inch (0.13 mm.).

The manufacturer and purchaser shall agree upon tolerances for couliissant or telescoping tubes.

(b) The variation in wall thickness may be  $\pm 10$  per cent. of the dimensions specified.

(c) In no part of any tube shall the departure from straightness exceed 1 in 600.

**DELIVERY, PACKING, AND SHIPPING.**—9. All tubes shall be well oiled and delivered in boxes not exceeding 220 pounds (100 kg.) gross weight.

When electric or crucible furnace steel is specified in the order, the maximum allowable percentages of phosphorus and sulphur may, at the option of the purchaser, be limited to 0.03 per cent.

**SPECIFICATIONS FOR MEDIUM CARBON STEEL TUBES.**

**GENERAL.**—1. The general specifications 1G1, shall form, according to their applicability, a part of these specifications.

**USE.**—2. These tubes are suitable for stressed parts, such as braces and tie tubes.

**MATERIAL.**—3. The I. A. S. B. standard steel No. 1035 shall be used. Its composition is as follows:

	Per cent.
Carbon .....	0.30—0.40
Manganese .....	.50—.80
Phosphorus, maximum .....	.045
Sulphur, maximum .....	.050

**MANUFACTURE.**—4. (a) The tubes are to be of the cold-drawn, seamless type.

**HEAT TREATMENT.**—(b) The tubes shall be heat treated to give the physical properties specified. It is desirable that they be quenched in oil.

(c) Any tube may be rejected at any time because of injurious defects or faults in the steel which are revealed by manufacturing operations, notwithstanding the fact that it has previously passed inspection. Such rejected material shall be returned to the manufacturer at the latter's expense. This clause shall not apply to materials fabricated after export.

**WORKMANSHIP AND FINISH.**—5. The tubes are to be smooth, of the section specified, and within the permissible tolerances as to wall thickness, of uniform diameter, free from scale, dirt, specks, longitudinal seaming, lamination, grooving and blistering, both internally and externally.

**PHYSICAL PROPERTIES AND TESTS.**—6. The tubes shall have the following physical properties:

**TENSILE TEST.**—(a)

Minimum tensile strength, 80,000 pounds per square inch (56.24 kg./mm.<sup>2</sup>).

Minimum yield point, 60,000 pounds per square inch (42.18 kg./mm.<sup>2</sup>).

Minimum elongation, either 20 per cent. in 2 inches (50.8 mm.) or 12 per cent. in 8 inches (203.2 mm.).

**CRUSHING TEST.**—(b) The test specimen shall be crushed endwise until the outside diameter is increased in one zone by 25 per cent., or until one complete fold is formed. The specimen shall stand this treatment without cracking.

**SELECTION OF TEST SPECIMENS.**—7. One test specimen for the tensile test shall be chosen from every 400 feet (121.9 m.) of tubing and one test specimen for the crushing test from every 100 feet (30.5 m.) of tubing.

The specimens for the crushing tests shall have a length of 1.5 times the diameter of the tube.

Whenever possible the selection of test specimens shall be made by heats.

**CHEMICAL COMPOSITION OF STANDARD ALLOY STEELS.****NICKEL STEELS.**

Number.	Carbon.	Manganese	Phosphorus maximum.	Sulphur, maximum.	Nickel.	Chromium.
2320.....	.15—.25	.30—.60	.040	.045	3.25—3.75	.....
2325.....	.20—.30	.50—.80	.040	.045	3.25—3.75	.....
2330.....	.25—.35	.50—.80	.040	.045	3.25—3.75	.....

**CHROMIUM VANADIUM STEELS**

Number.	Carbon.	Manganese.	Phosphorus maximum.	Sulphur, maximum.	Chromium.	Vanadium, minimum.
6120.....	0.15—0.25	0.30—0.60	0.040	0.045	0.60—0.90	0.15
6130.....	.25—.35	.50—.80	.040	.045	.80—1.10	.15





# ASCOL

# SERVICE

Copies of "Aircraft Supplies," containing a complete Illustrated List of Aircraft Parts in stock up to the time of going to press, Current Prices, Details of New Items, Enquiry Bureau, Charts and Tables of

## For the Dispatch of Aircraft Parts.

We are now using a new type of cardboard box, as illustrated, for conveniently dispatching small aircraft parts.



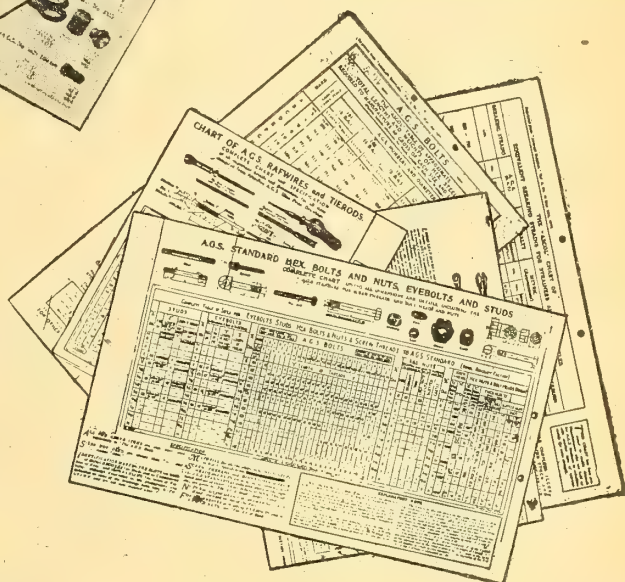
A few pages from "Aircraft Supplies," our Fortnightly House Journal



Various Parts, and Short Articles of interest to Aircraft Manufacturers, will be sent free to the Air Services and to the Aircraft Industry upon application on business or official paper.

## ASCOL Reference Charts.

Copies of Charts, as illustrated, giving details and the dimensions of A.G.S. BOLTS and NUTS mounted on cardboard will be sent free upon application



## THE AIRCRAFT SUPPLIES COMPANY LTD

CONTRACTORS TO THE AIR BOARD.

Head Offices, Showrooms, and Stores:

ASCOL HOUSE, 125, LONG ACRE, LONDON, W.C. 2.

Representatives in Birmingham, Manchester, Leeds, Belfast, Northern Counties and Scotland, South Coast, and the London District.

Managing Director:  
G. H. MANSFIELD.

Works:  
Little James St.

Telephone:  
Gerrard 276.

Telegrams:  
"Upcast, Rand,"  
London.

(Private Branch Exchange.)



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



TABLE I.—STANDARD STEEL BARS, ROUND OR SQUARE.

Hot rolled.				Bright rolled and drawn.			
Size of bar (diameter or width across flats)		Tolerance.		Size of bar (diameter or width across flats).		Tolerance.	
Inches.	Millimeters.	Inch.	Millimeters	Inches.	Millimeters.	Inch.	Millimeter
0-0.875	0-22.23	+0.010	+0.25	0-0.563	0-14.30	-0.002	-0.05
0.876-1.250	22.25-31.75	+0.015	+0.38	0.564-1.125	14.33-28.58	-0.003	-0.08
1.251-1.625	31.78-41.28	+0.020	+0.51	1.126-1.875	28.60-47.63	-0.004	-0.10
1.626-1.875	41.30-47.63	+0.025	+0.64	1.876-3.000	47.65-76.20	-0.005	-0.13
1.876-3.000	47.65-76.20	+0.050	+1.27	3.001-4.000	76.23-101.60	-0.006	-0.15
3.001-4.000	76.23-101.60	+0.075	+1.91	4.001-5.000	101.63-127.00	-0.007	-0.18
4.001-5.000	101.63-127.00	+0.100	+2.54	5.001	127.03	-0.008	-0.20
5.001	127.03	+0.150	+3.81				

TABLE 2—Standard steel bars, hexagon

Hot rolled.				Bright rolled and drawn			
Size of bar (width across flats)		Tolerance.		Size of bar (width across flats).		Tolerance.	
Inches.	Millimeters.	Inch.	Millimeter.	Inches.	Millimeters.	Inch.	Millimeter.
0-0.875	0-22.23	+0.010	+0.25	0-0.563	0-14.30	-0.002	-0.05
0.876-1.250	22.25-31.75	+0.015	+0.38	0.564-0.938	14.32-23.83	-0.003	-0.08
1.251-2.000	31.78-50.80	+0.020	+0.51	0.939-2.000	23.85-50.80	-0.004	-0.10
2.001-3.000	50.83-76.20	+0.025	+0.64	2.001-3.000	50.83-76.20	-0.005	-0.13
3.001	76.23	+0.030	+0.76	3.001	76.23	-0.006	-0.15

DIMENSIONS AND TOLERANCES.—8. (a) The following tolerances will be allowed on the outside diameter of tubes :

Tubes under 1.5 inches (38.1 mm.) diameter,  $\pm 0.003$  inch (0.08 mm.).

Tubes over 1.5 inches (38.1 mm.) diameter,  $\pm 0.005$  inch (0.13 mm.).

The manufacturer and purchaser shall agree upon tolerances for couissant or telescoping tubes.

(b) The variation in wall thickness may be  $\pm 10$  per cent. of the dimension specified.

(c) In no part of any tube shall the departure from straightness exceed 1 in 600.

DELIVERY, PACKING, AND SHIPPING.—9. All tubes shall be well oiled and delivered in boxes not exceeding 220 pounds (100 kg.) gross weight.

#### SPECIFICATIONS FOR WELDED STEEL TUBES.

GENERAL.—1. The general specifications of the I.A.S.B. shall form, according to their applicability, a part of these specifications.

USE.—2. These tubes are suitable only for unstressed parts, such as conduit tubes.

MATERIAL.—3. The I.A.S.B. standard steel, No. 1020, shall be used. Its composition is as follows :

	Per cent.
Carbon .....	0.15-0.25
Manganese .....	.30-.60
Phosphorus, maximum .....	.045
Sulphur, maximum .....	.050

MANUFACTURE.—4. All tubes shall be of the welded type. They must be carefully annealed before the final pass.

Any tube may be rejected at any time because of injurious defects or faults in the steel which are revealed by manufacturing operations, notwithstanding the fact that it has previously passed inspection. Such rejected material shall be returned to the manufacturer at the latter's expense. This clause shall not apply to materials fabricated after export.

WORKMANSHIP AND FINISH.—5. The tubes are to be smooth, of the section specified, and within the permissible tolerances as to wall thickness, of uniform diameter, free from scale, dirt, specks, longitudinal seaming, lamination, grooving, and blistering, both internally and externally.

PHYSICAL PROPERTIES AND TESTS.—6. The tubes shall have the following physical properties :

CRUSHING TEST.—One test specimen from every 100 feet (30.5 m.) of tubing is to be crushed endwise until the outside diameter is increased in one zone by 25 per cent., or until one complete fold is formed. The specimen shall stand this treatment without cracking.

Whenever possible the selection of test specimens shall be made by heats.

The specimens for the crushing tests shall have a length of 1.5 times the diameter of the tube.

DIMENSIONS AND TOLERANCES.—7 (a). The following tolerances will be allowed on the outside diameter of tubes :—

Tubes under 1.5 inches (38.1 mm.) diameter,  $\pm 0.005$  inch (0.13 mm.).

Tubes over 1.5 inches (38.1 mm.) diameter,  $\pm 0.010$  inch (0.25 mm.).

(b) The variation in wall thickness may be  $\pm 10$  per cent. of the dimension specified.

(c) In no part of any tube shall the departure from straightness exceed 1 in 600.

DELIVERY, PACKING, AND SHIPPING.—8. All tubes shall be well oiled and delivered in boxes not exceeding 220 pounds (100 kg.) gross weight.

TOLERANCES ON STEEL BARS, SHEETS, TUBES, WIRES, AND CABLES.

The following tables and text indicate the tolerances which will be considered standard for the I.A.S.B. :—

TABLE 3.—Standard steel sheets

Thickness		Tolerance for sheets 14 inches (355.6 mm.) wide and under		Tolerance for sheets over 14 inches (355.6 mm.) wide	
Inch.	Millimeters	Inch.	Millimeter.	Inch.	Millimeter.
0-0.020	0-0.51	+0.001	+0.03	$\pm 0.002$	$\pm 0.05$
		— .002	— .05		
0.021-.030	0.53-.76	+0.002	+0.05	$\pm .003$	$\pm .08$
		— .003	— .08		
.031-.040	.79-1.02	$\pm .003$	$\pm .08$	$\pm .003$	$\pm .08$
.041-.050	1.04-1.27	$\pm .003$	$\pm .08$	$\pm .004$	$\pm .10$
.051-.065	1.30-1.65	$\pm .004$	$\pm .10$	$\pm .004$	$\pm .10$
.066-.080	1.68-2.03	$\pm .004$	$\pm .10$	$\pm .005$	$\pm .13$
.081-.100	2.06-2.54	$\pm .006$	$\pm .15$	$\pm .006$	$\pm .15$
.101-.120	2.57-3.05	$\pm .006$	$\pm .15$	$\pm .007$	$\pm .18$
.121-.250	3.07-6.35	$\pm .006$	$\pm .15$	$\pm .008$	$\pm .20$

STEEL TUBES.—1. The following tolerances will be allowed on the outside diameter of tubes :—

Seamless tubes :

For tubes under 1.5 inches (38.1 mm.) diameter  $\pm 0.003$  inch (0.08 mm.).

For tubes over 1.5 inches (38.1 mm.) diameter  $\pm 0.005$  inch (0.13 mm.).

Welded tubes :

For tubes under 1.5 inches (38.1 mm.) diameter  $\pm 0.005$  inch (0.13 mm.).

For tubes over 1.5 inches (38.1 mm.) diameter  $\pm 0.010$  inch (0.25 mm.).

The tolerances on couissant or telescoping tubes shall be decided between manufacturer and purchaser.

The permissible limit of variation of wall thickness shall be  $\pm 10$  per cent. of the dimensions specified.

WIRES AND CABLES.—2. The following tolerances will be allowed on wires and cables :—

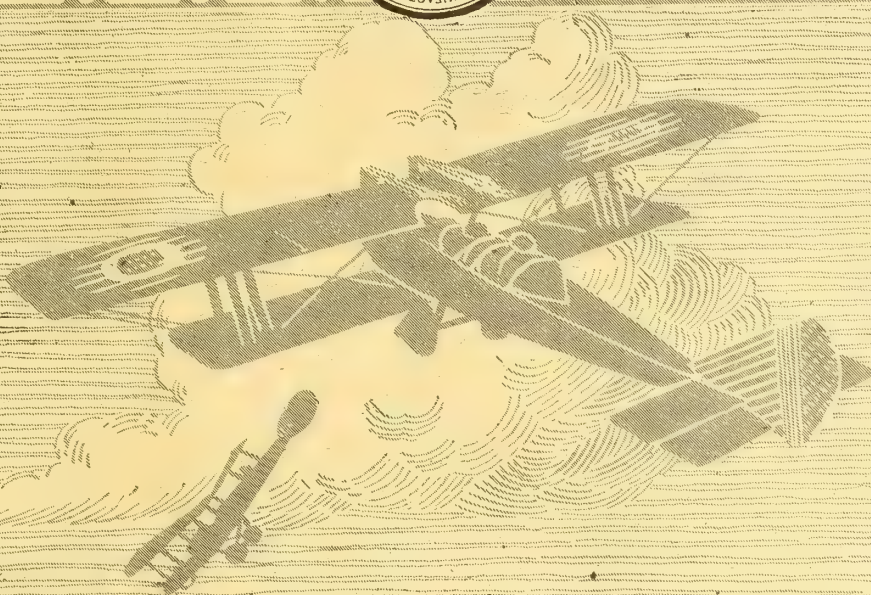
HIGH-STRENGTH STEEL WIRE.—(a) A permissible variation of 0.002 inch (0.51 mm.) above gauge on all sizes will be accepted, but no wire will be accepted having a variation of more than 0.0005 inch (0.013 mm.) below gauge.

19 NONFLEXIBLE STEEL-WIRE CABLE.—(b) There shall be no permissible variation in diameter below size. Cable having a diameter of 0.031 (1/32) to 0.156 (5/32) inch (0.79 to 3.97 mm.), inclusive, shall have a permissible variation of 10 per cent. above size, and cable having a diameter of 0.1875 (3/16) to 0.375 (3/8) inch (4.76 to 9.53 mm.), inclusive, shall have a permissible variation of 7 per cent. above size.

7 x 7 FLEXIBLE STEEL-WIRE CABLE.—(c) There shall be no permissible variation in diameter below size. Cable having a diameter of 0.063 (1/16) to 0.094 (3/32) inch (1.59 to 2.38 mm.),

(Continued on page 501.)



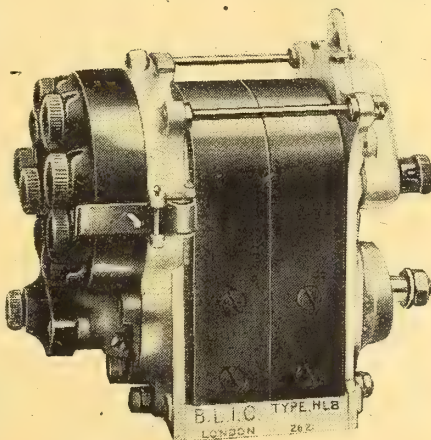


**THE HEART OF THE AEROPLANE—**  
the vital centre of its power unit—is undoubtedly  
the magneto. Failure there must be unthinkable!  
That is why the "B.L.I.C." Magneto is supreme—  
its absolute reliability may be taken for granted!

# B.L.I.C.

THE BRITISH LIGHTING & IGNITION CO. LTD.

THE BRITISH  
LIGHTING AND  
IGNITION Co., Ltd.



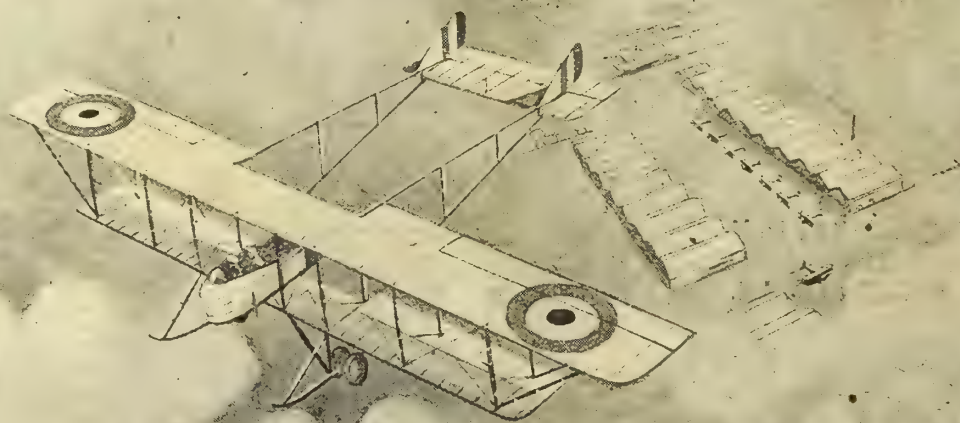
204, Tottenham Court  
Road, London, W. 1.  
Proprietors: VICKERS Ltd.





# WHITEHEAD

# AIRCRAFT



GEORGE WATSON  
1917

## RICHMOND SURREY



NON-POISONOUS  
DOPE

TITANINE



THE  
BRITISH AEROPLANE  
VARNISH CO., LTD.  
166, PICCADILLY, LONDON, W.1

Telephone : . . . . . GERRARD 2221.  
Telegrams : TETRAFREE, POSTV, LONDON.



# ALUMINIUM CASTINGS

OF EVERY DESCRIPTION.

We make a  
Speciality  
of  
Aeronautical  
and  
Automobile  
Work.

We are making many thousands of **Aluminium Die Castings** weekly under the celebrated **Cothlas** process—in many cases **entirely eliminating** machining operations, and we hold the sole manufacturing rights in the British Empire for this process.

Chemical and Physical tests are made on our own premises, and our **Castings**, both **Sand** and **Die**, are produced under the most up-to-date and scientific methods.

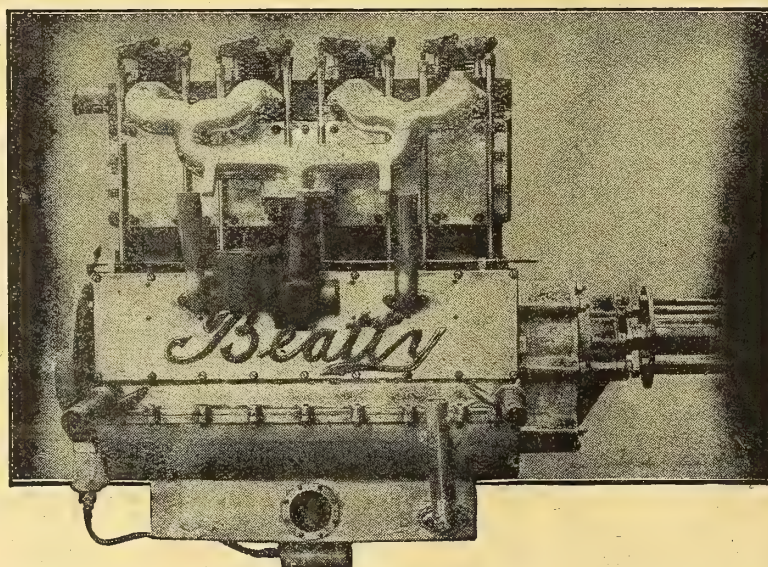
Sole makers of the **Birmal Aluminium Pistons**, thousands of which are running to-day in a highly satisfactory manner under the most severe conditions.

Highest  
Class  
Castings to  
Government  
Specifications.  
Prompt  
Delivery.

**BIRMINGHAM ALUMINIUM CASTING (1903) CO., LD.**  
**Cambridge Street Works, BIRMINGHAM.**

## The Beatty Monobloc Aero Engine

H.P. = 60.  
R.P.M. = 1800  
Engine Shaft.  
Prop. speed =  
1200 R.P.M.  
Weight = 225 lbs



Petrol  
Consumption  
4.28 galls. per  
hour.

Oil  
Consumption  
.18 galls. per  
hour.

*Specially Designed and Developed for School Work.*

FULL PARTICULARS **The Beatty School of Flying Ltd.** LONDON AERODROME  
Telephone . . . Kingsbury 138.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# STEEL TUBING IN STOCK

TRADE MARK.



MEANS LONG LIFE

Get your Requirements at once. We have a very large quantity of  $\frac{3}{8}$  in. outside diameter by 10, 11, 12, 13, 14 and 15, gauge, besides other small diameters.

This stock will not last long, and we advise buyers to send instructions immediately.

**The Steel Tube, Tubular Spanner & Presswork People.**

Telegrams:

"Accles,  
Oldbury."A.B.C. Code,  
5th Edition.

Telephones:

Oldbury, 111.

(4 Lines.)

OLDBURY,

BIRMINGHAM.

Contractors to H.M. Admiralty, War Office and Foreign Governments.

## The BRITISH CAUDRON CO., LTD.

SOLE BUILDING AND SELLING RIGHTS FOR

**Caudron Aeroplanes  
and Hydro-Aeroplanes**  
FOR  
**THE BRITISH EMPIRE AND DEPENDENCIES**

Head Office and Works:

BROADWAY, CRICKLEWOOD, N.W.2.

Cable and Telegraphic Address: "CAUDROPLAN, CRICKLE, LONDON."

Phone: 4647  
4648 HAMPSTEAD

Scottish Factory and Aerodrome:

ALLOA.

Cable and Telegraphic Address: "CAUDROPLAN, ALLOA."

Phone: 52

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# NIEUPOORT

AND

GENERAL AIRCRAFT COMPANY, L<sup>TD</sup>.

CONTRACTORS TO H.M. GOVERNMENT.

OFFICE AND WORKS—  
LANGTON ROAD,  
CRICKLEWOOD, LONDON, N.W.2

TELEPHONE (3 LINES)—  
WILLESDEN 2455

TELEGRAMS—  
NIEUSCOUT, CRICKLE, LONDON

## Urgent Requirements.

**STAFF.** SEVERAL FIRST-CLASS DRAUGHTSMEN.  
Good Salaries offered to competent and experienced men.  
No one at present engaged on Government work  
need apply.

**MATERIAL.** Offers required for the following:—

Tinned Steel Sheets, various gauges  
Aluminium, do. do. do.

wood,  $\frac{1}{8}$ ",  $\frac{3}{16}$ ",  $\frac{1}{4}$ ",  $\frac{1}{2}$ ",  $\frac{3}{8}$ ",  $\frac{5}{8}$ ",  $\frac{1}{2}$ ",  $\frac{1}{8}$ "

● All types of Metal Fittings  
for AVRO 504J  
Biplanes.



**THE GRAHAME-WHITE AVIATION CO., LTD.,**  
**AERONAUTICAL ENGINEERS.**

## NOTICE

To DeH.6. Contractors.

We can supply *ex* STOCK  
BLANKINGS for all Metal Parts  
and AXLES complete.

*Special developments of the following:—*

Parts Nos. 9485 } Three blankings per set.  
" " 9488 }

Telephone:—Kingsbury 120 (5 lines).

Telegrams:—Volplane, Hyde, London.

THE LONDON AERODROME, HENDON, N.W.9

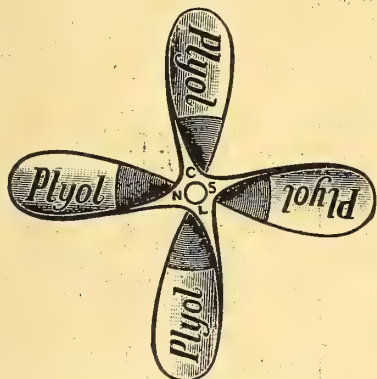
Proprietors of the London Aerodrome and the Grahame-White School of Flying.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



**"PLYOL"**

THE  
BEST CEMENT  
FOR  
THREE-PLY,  
Veneering, etc.



Registered Trade Mark.

**ALDGATE CASEIN WORKS.****NIEUWHOF, SURIE & Co., Ltd.**

HEAD OFFICE:

**5, Lloyds Avenue, London, E.C. 3.**


Works:

**ALDGATE AVENUE, ALDGATE, E.C.**

Also Caseln especially adapted for  
Waterproof Paints, Varnish, etc.

Telephones:  
AVENUE 34, 35.

Telegrams:  
'SURICODON, FEN LONDON.'



*Non-Flame  
Celluloid*

Phone Central 1306 & 1307  
Telegrams GREENBERG LONDON

**GREENHILL & SONS**  
**8 WATER-LANE LUDGATE-HILL**  
**LONDON. E.C. 4**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





# The Aeroplane

## Acceptance and Experimental Flights—

The Procter Isaac Aviation Co. "Aeromonia, Piccy, London. Gerrard 278 (2 lines).

## Acetylene Welding Plant—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.  
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

## Aeroplane Manufacturers—

Aircraft Manufacturing Co., Ltd., Hendon. "Airmanship, Hyde, London." Kingsbury 180.

Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle-on-Tyne. "Armstrong Aviation, Newcastle-on-Tyne." Gosforth 500.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds "Propellers, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

British & Colonial Aeroplane Co., Ltd. (The Bristol Co.), Filton, Bristol. "Aviation, Bristol." Bristol 3906.

British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudronplan, Crickle, London." Hampstead 5551.

Central Aircraft Co., Palmerston Works, High Road, Kilburn, N.W.6. "Aviduction, Phone, London." Hampstead 4403 and 4404.

Davidson Aviation Co., Ltd., Hammersmith, W.6. "Hammersmith 1144-1145.

Eastbourne Aviation Co., Ltd., Eastbourne. "Aircraft, Eastbourne." Eastbourne 1176.

Graham-White Aviation Co., Ltd., London Aerodrome, Hendon. "Volplane, Hyde, London." Kingsbury 120.

Handley Page, Ltd., 110, Cricklewood Lane, N.W.2. "Hydrophid, Crickle, London." Hampstead 7420.

Hooper & Co., Ltd., 54, St. James St. Piccadilly, London, S.W. "Sociable, St. James, London." Regent 912.

Mann, Egerton & Co., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Martinsyde, Ltd., Brooklands, Byfleet. "Martinsyde, Weybridge." Woking 331; Byfleet 171.

National Aircraft Co., Ltd., 15, Hackney Road, N.E.2. London Wall 6725.

"Nieuport" & General Aircraft Co., Cricklewood, London, N.W.2. "Nieuport, Crickle, London." Willesden 2455.

Norman-Thompson Flight Co., Ltd., Bognor. "Soaring, Bognor." Bognor 48.

The Regent Carriage Co., Ltd., 126/132, New King's Road, Fulham, S.W.6. "Carbodis, London." Putney 2240-2241.

Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester." City 8530-8531, Manchester.

Saunders, S. E., Ltd., East Cowes, I.O.W. "Consuta, East Cowes." Cowes 193.

Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tested, Phone, London." Regent 378.

Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston." Kingston 744.

Standard Aircraft Manufacturing Co., Effingham Ham, Arundel Street, W.C.2. "Gunsgrush, Estrand, London." City 89.

Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickerfyta, Knights, London." Kensington 6810.

Waring & Gillow, Ltd., Hammersmith. "Warisen, Ox, London." Museum 5000.

Westland Aircraft Works, Yeovil. "Aircraft, Yeovil." Yeovil 129.

White, J. Samuel, & Co., Ltd., East Cowes. "White, East Cowes." Cowes 3.

Whitehead Aircraft (1917), Ltd., Richmond Surrey. "Whitecraft, Richmond, Surrey." Richmond 1865.

Wycombe Aircraft Constructors, Ltd., High Wycombe, Bucks. "Aircraft, High Wycombe." High Wycombe 84.

## Airships—

Airships, Ltd., High Street, Merton.

Short Bros., Rochester, Eastchurch, and Whitehall House, S.W. "Tested, Phone, London." Regent 378.

## Aluminium Castings (Sand & Die)

Coan, R. W., 210, Goswell Road, London, E.C.1. "Krankases, Isling, London." City 846.

## Bearings (Etonia Cast Phosphor Bronze)—

Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds." Central 3927.

## Brass Sheets for Tipping Propellers—

Pritt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fen, London." Avenue 995, 996, and 7006.

## Buildings—

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

Palmer, T. W., & Co., Church Road, Merton Abbey, Surrey. Wimbledon 1313.

Rusery Owen & Co., Darlston, South Staffs. The Willey Co., Ltd., Salisbury House, London Wall, E.C.2. "Wrathless, Phone, London." City 268.

## Cable Coverings and Cable Controls—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Capstan Work—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Carburettors—

Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.1. Victoria 4670.

## Casein—

Nieuwhof, Surie & Co., Ltd., 5, Lloyds Avenue, London, E.C.3. "Surico, Fen, London." Avenue 34 and 35.

## Castings—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Castings (Aluminium, Brass, Bronze, Machined or Rough)—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Celluloid (Non-Flam.)—

Greenhill & Sons, 8, Water Lane, E.C. "Greenberg, London." Central 1306-7.

London Label Co., Beckett Road, E.16. "Londalabel, Canning, London." East 1300.

## Clothing—

Burberry's, Ltd., Haymarket, S.W.1. Regent 2165.

Dunhill's, Ltd., Euston Road, N.W.1. "Dunhill, London." North 3405-6.

## Component Parts—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines).

B. D. V. Aircraft Spares, Syon Chambers, 16a, Kew Road, Richmond, Surrey. "Aeros, Richmond." Richmond 1681.

Central Aircraft Co., Palmerston Works, High Rd., Kilburn, N.W.6. Hampstead, 4728.

"Aviduction, Phone, London." "Aviduction, Phone, London." "Aviduction, Phone, London."

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

The Aircraft Construction Co., Harley Works, Beckett Road, E.16. "Aeracracons, Canning, London." East 1300.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

## Cords, Tapes, and Threads—

MacLennan, J., & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.

## Dopes—

British Aeroplane Varnish Co., Ltd., 166, Piccadilly, W.1. "Tetrafree, Piccy, London." Gerrard 2312.

British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellutate, London." Regent 4046.

The British Enamille Co., Ltd., 30, Regent Street, S.W.1. "Ridleyren, Piccy, London." Gerrard 280.

Cellon, Ltd., Broad Street House, New Broad Street, E.C.2. "Ajawb, London." London Wall 5350-3622.

Clark, Robert, Ingham & Co., Ltd., Walter House, Bedford Street, Strand, W.C. "Pearline, Westrand." Regent 3923.

## Electrical Accessories—

Belling & Co., Derby Road Works, Montague Road, Upper Edmonton, N.18. "Belling, Edmonton." Tottenham 1084.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207, London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Eusroad, London." Museum 70.

Premier Electric Heaters, Ltd., 258, 259, and 360, Bradford Street, Birmingham. "Fahrenheith, Birmingham." Midland 681.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

## Electric Cables—

E. Kalker & Co., Coventry. "Kalker, Coventry." Coventry 24x.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207, London Wall 1564.

## Electric Lighting and Power—

E. Stanley Fardon, A.M.I.E.E., 67, Mosley Street, Manchester.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207, London Wall 1564.

## Engines and Parts—

Allen, W. H., Son & Co., Ltd., Queen's Engineering Works, Bedford. "Pump, Bedford." Bedford No. 1.

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

The Beatty School of Flying, Ltd., The Broadway, Cricklewood, N.W.2. Hampstead 3000.

Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London." Gerrard 238.

Dudbridge Iron Works, Ltd. (Salmson), 87, Victoria Street, London S.W.1. "Aero-light, Vic, London." Vic 7026.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

Gordon Watney & Co., Ltd., Weybridge. "Mercedes, Weybridge." Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham. Richmond 1293.

Gwynnes, Ltd., Hammersmith Iron Works, Hammersmith, W. "Gwynne, Hammersmith." Hammersmith 1910.

Napier & Son, D., Ltd., 14, New Burlington Street, London, W., and at Acton, W. "Nitripher, London." Gerrard 8226.

Robertson, J. H., & Co., 1, Albemarle Street, London, W.1. Regent 3906.

Rolls-Royce, Ltd., 14 and 15, Conduit St., W.1. "Rolhead, London." Gerrard 1654-5-6.

The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. Regent 1181.

Sturtevant, B. F., Co., Ltd., Hyde Park, Boston, U.S.A.

Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorfield, Wolverhampton." Wolverhampton 985.

The Gnome & Le Rhône Engine Co., Ltd., 47, Victoria Street, S.W. "Elevenfold, London." Walthamstow 408 (2 lines).

## Flare Lights—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

## Flexible Shafts—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Flying Schools—

Bournemouth Aviation Co., Ltd., Talbot Village, Bournemouth. "Eches, Winton." Bournemouth 1160.

Cambridge School of Flying and Aerodrome Co., on, St. Andrews St., Cambridge. "Carbon, Cambridge." Cambridge 5 and 1086.

## Furniture (Office)—

Cooke's (Finsbury), Ltd., Finsbury Pavement House, London, E.C.2. London Wall 573 and 6179.

## Galvanising—

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

The Rustless Iron (Copper Coles Process), Ltd., 1, French St., Sunbury-on-Thames, Middlesex. Sunbury 37.

## Gears—

Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham." East 407.

## Glue—

Central Chemicals, Ltd., 283, West End Lane, London, N.W.6. "Entramical, Westham, London." "Excidren, Wapp, London." Avenue 3178.

Mendine Co., 8, Arthur Street, E.C. Bank 5873.

Oldroyd, Wm., & Sons, Ltd., 9, Mincing Lane, E.C.3.

## Goggles—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

## Heating and Ventilating—

Chas. P. Kinnell & Co., Ltd., 65 & 65a Southwark Street, London, S.E.1. "Kinnell, London." Hop 372 (2 lines).

## Hollow Spars—

McGruer Bentwood Hollow Spar Co., Commercial Wharf, Lambeth, S.E. "Gabrielson, Watloo, London." Hop 718.

Robert Young's Construction Co., Ltd., Canonbury Works, Canonbury Street, Essex Rd., London, N.1.

## Instruments—

British Wright Co., Ltd., 33, Chancery Lane, W.C.2. Holborn 1308.

## Instruments (Scientific, Altimeters, etc.)—

The Cambridge Scientific Instrument Co., Ltd., Cambridge. "Instrument, Cambridge." Cambridge 642.

Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, Phone, London." Walthamstow 180.



# Buyers' Guide.



## Machine Tools—

Brewster & Co., 11, Queen Victoria Street, E.C.4. "Circumfuse, Cannon, London." City 768.

## Magneto Driving Pieces—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Magnetos—

The M.I. Magneto Syndicate, Ltd., Victoria Works, Coventry. "Corlton, Coventry." Coventry 1008-1009.

The British Lighting & Ignition Co., Ltd., 204, Tottenham Court Road, W.1. "Vicks-mag, Phone, London." Museum 430.

Ericsson Manufacturing Co. (Berling Magneto), Buffalo, N.Y., U.S.A.

## Metal Manufacturers—

Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 42-43.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

## Metals in General—

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Pritt & Co., 46, Fenchurch Street, London, E.C.3. "Petry, Fen, London." Avenue 905, 906, and 7006.

Samuel Mercer & Co., 198, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

## Metal Parts and Fittings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

Aircraft Supplies Co., Ltd., Ascot House, 125, Long Acre, W.C.2. "Upcast, Rand, London." Gerrard 276 (2 lines).

Arnott & Harrison, Ltd., Hythe Road, Willesden Junction. Willesden 2297.

Bayliss, Jones & Bayliss, Ltd., Wolverhampton. (Bolts and Nuts.) "Bayliss, Wolverhampton." Wolverhampton 1041.

The Birmingham Guild, Ltd., 45, Gt. Charles Street, Birmingham. "Handicraft." Central 3705.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

The British Gold Shell Ring Co., Ltd., Inverness Road, Hounslow, London. "Golshel, Hounslow." Hounslow 254.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Euston, London." Museum 70.

Mountford, Fredk., Ltd., Fremo Works, Lifford, Birmingham. "Fremo, Birmingham." Kings Norton 261.

Robertson, J. H., & Co., 1, Albemarle Street, London, W.1. Regent 3906.

Rubery, Owen, & Co., Darlaston South Staffs.

Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66.

The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulvulpit, Phone, London." Holborn 410.

The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. Regent 1181.

The Aircraft Construction Co., Harley Works, Beclon Road, E.16. "Aeracracons, Canning, London." East 1300.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

Thompson Bros., Ltd., Bradley, Bilton. "Thompson Bros., Bilton." Bilton 10.

Wooler Engineering Co., Ltd., Old Oak Common Lane, Willesden Junction, N.W.10.

## Metal Shearing Tools—

Montgomery, Smith, & Co., Ltd., Tangent Works, Keynsham, near Bristol. "Ingenuity, Salford." Keynsham 21.

## Metal Spinings—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Metric Bolts—

Cashmore Bros., Zola Works, Hildreth Street, Balham, S.W. Battersea 415.

Rubery Owen & Co., Darlaston, South Staffs.

## Miscellaneous—

Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast." Belfast 4033-4034-4035.

Anti-Glare Glass Co., Ltd., 30, Wigmore Street, "Wingateise, London." Mayfair 2353.

Bowden Wire, Ltd., Willesden Junction, "Bowirelim, Harles, London." Willesden 2400 (3 lines).

British Metal (Kingston), Ltd., Kingston-on-Thames.

Brown Bros., Ltd., Great Eastern Street, E.C.1. "Imbrowned, Bethroad, London." London Wall 6900.

Herbert Frood Co., Ltd., Chapel-en-le-Frith. "Froolobruke, Birmingham." Central 793.

Endolithic Manufacturing Co., Ltd., 61½, Fore Street, London, E.C.2. Labels in Metal, Ivory, Ivoryine, etc.

Glasso Manufacturing Co., Ltd., 211, City Road, E.2. City 9558.

London Label Co., Ltd., Harley Works, Beclon Road, E.16. "Nonlamoid" Nonflammable Celluloid. "Lonlabel, Canning, London." East 1300.

MacLennan, J., & Co., 30, Newgate Street, E.C.1, and at Glasgow. Tapes, Cords and Threads. City 3115.

## Motor Cars—

Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

Mann, Egerton & Co., Ltd., 379/381, Euston Road, London, N.W.1. "Manegear, Euston, London." Museum 70.

Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 530 (4 lin. 5).

## Nameplates and Labels—

British Metal (Kingston), Ltd., Kingston-on-Thames.

Endolithic Manufacturing Co., Ltd., 61½, Fore Street, London, E.C.2.

The Clegg Metal Engraving Co., Chatsworth Works, Worthing. "Clegg Worthing."

## Observation Panels—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

## Parachutes—

E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemalivo, Ave, London." London Wall 3266-3267.

## Pattern Making—

Fredk. Ward, 6, 7 and 8, Allsop Street, Upper Baker Street, W. Padd 4743.

## Piston Rings—

British Chuck & Piston Ring Co., Coventry. "Rings, Coventry." Coventry 723.

## Power Presses and Dies—

Bliss, E. W., & Co., 28, Pocock Street, Blackfriars Road, London, S.E.1. "Blissdon, Hop 4340.

## Presswork—

Rubery Owen & Co., Darlaston, South Staffs. Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Propellers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames. "Ebora, Kingston." Kingston 672.

Integral Propeller Co., Ltd. "Avirop, Hyde, London." Hendon 9. Kingsbury 104.

Lang Propeller, Ltd., Weybridge. "Aerosticks, Weybridge." Weybridge 520-521.

Mann, Egerton & Co., Ltd., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Oddy, W. D., & Co., Leeds. "Aircscrews, Leeds." Central 291, Leeds.

Stanley Aviation Co., 67, Kingsland Road, E.2. City 8347.

Westland Aircraft Works, Yeovil. "Aircraft, Yeovil." Yeovil 129.

The Foster Instrument Co., Letchworth, Herts. Foster Instruments, Letchworth, Letchworth 26.

## Rigging for Aircraft—

Craddock, Geo., & Co., Ltd., Wakefield, England. "Craddock, Wakefield." Wakefield 466 (3 lines).

## Rubber Tubing & Accessories—

Hancock, James Lyne, Ltd., 266, Goswell Road, London, E.C.1. "Masticator, Isling, London." City 3811 and 3812.

## Safety Belts—

Holmes, C. H., & Son, 38, Albert Street, Manchester. "Semloh, Manchester." City 4432.

## Screw-driving Machines—

Russell Bros. (Redditch), Ltd., Littleworth, Redditch. "Inventors, Redditch." Redditch 74.

## Seaplane Manufacturers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

Mann, Egerton & Co., Ltd., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

The Norman Thompson Flight Co., Ltd., Mid-dleton, Bognor. "Soaring, Bognor." Bognor 48.

Short Bros., Rochester. "Seaplanes, Rochester." Chatham 627.

Supermarine Aviation Co., Ltd., Southampton. "Supermarine, Southampton." Southampton 1337.

## Searchlights and Landing Lights—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

## Seats for Aeroplanes—

Bowser, E., Art Cane Works, 50 Park Lane, Leeds. Central 3473.

## Shackles—

The British Gold Shell Ring Co., Ltd., Inverness Road, Hounslow. "Golshel, Hounslow." Hounslow 254.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

The British Gold Shell Ring Co., Ltd., Inverness Road, Hounslow. "Golshel, Hounslow." Hounslow 254.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

## Sheet Metal Pressings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

Blackburn Aeroplane and Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345.

W. H. Briscoe & Co., Ltd., 51 and 52, Park Street, Birmingham. "Brisk, Blum." Central 550.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

London Aluminium Co., Ltd., Westwood Road, Aston, Birmingham. East 497 Birmingham.

Rubery Owen & Co., Darlaston, South Staffs.

## Sheet Metal Work—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4870.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Rubery Owen & Co., Darlaston, South Staffs.

The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4870.

The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. Regent 1181.

Arthur Hill & Co., Silchester Road, North Kensington, W. Park 1443.

## Shock Absorbers (Elastic Cord)—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Sparking Plugs—

Lodge Sparking Plug Co., Ltd., Rugby. "Igniter, Rugby." Rugby 235.

Ripault, Leo, & Co., Ltd. (Oleo Plugs), 64a, Poland Street, W.1. "Ripault, Reg, London." Gerard 7758.

## Springs—

Dart Spring Co., West Bromwich. "Dart, West Bromwich." West Bromwich 322.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61 (3 lines).

## Stampings—

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

## Steel—

Firth, Thos., & Sons, Sheffield. "Firth, Sheffield." Sheffield 3230 to 3237.

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

Nicklin, Bernard, & Co., Birmingham. "Bernico, Birmingham." Smithwick 224.

## Steel Stamps and Markings—

John Meerloo & Sons, Cleveland Works, Cleveland Street, Mile End, E.1. "Dayhur, Phone, London." East 3331 (2 lines).

## Steel Tension Wires—

Craddock, Geo., & Co., Ltd., Wakefield, England. "Craddock, Wakefield." Wakefield 466

## Steel Tubes for Aeroplanes—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

## Taper Pins—

Mountford, Fredk. (Birmingham), Ltd., Fremo Works, Lifford, Birmingham. "Fremo, Birmingham." King's Norton 261-262.

## Tapes and Smallwares—

Brown, Percy, & Co., 49, Newgate Street, London, E.C.1. "Ominate, Cent, London." City 4659.

MacLennan, John, & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.

James North Hardy & Son, Ltd., 54, Portland Street, Manchester. "Hardson, Manchester." Central 6471.

## Timber—

Engineering Timber Co., Ltd., 9, Victoria Street, London, S.W. "Entikosil, Vic, London." Victoria 5073, 4210.

Brown, R. F., & F. W., Wollaton Saw Mills, near Nottingham. "Brown's Saw Mills, Wollaton." Nottingham 1526.

J. Owen & Sons, Ltd., 109a, Borough Hill Street, S.E.1. "Bucheron, London." Hop 3811 (2 lines).

## BUYERS' GUIDE cont. on next page.











**"The Aeroplane" Buyers' Guide.—continued.****Time Recorders—**

Gledhill-Brook Time Recorders, Ltd., 26, Victoria Street, S.W.1. Victoria 1310.

**Turnbuckles—**

Rubery Owen & Co., Darlaston, South Staffs.

**Tyres and Wheels—**

The Palmer Tyre, Ltd., Shaftesbury Avenue. "Tyricord, Westcent." Gerrard 1214 (5 lines)

**Undercarriages—**

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

**Varnishes—**

The British Emailite Co., Ltd., 30, Regent Street, S.W.1. "Ridleyren, Piccy, London." Gerrard 280.

Clark, R. Ingham & Co., Walter House, Bedford Street, Strand, W.C. "Pearline, Westrand." Regent 3923.

Harland, W. & Son, Merton, London, S.W.19. "Harland, Wimbledon 45." Wimbledon 45 and 1395.

Naylor Bros., Ltd., Southall, Middlesex. "Naylor, Southall." Southall 30.

**Vices—**

C. and J. Hampton, Ltd., Sheffield. "Vices, Sheffield." Attercliffe 95.

**Washers—**

Avenue 1432.  
Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3.  
Herbert Terry & Sons, Ltd. Redditch.  
"Springs, Redditch." Redditch 61.

**Watchmakers and Jewellers (Silver Models)—**

Goldsmiths' & Silversmiths' Co., Ltd., 112, Regent Street, W.1. Gerrard 9091 (3 lines).

**Welding and Cutting Plant—**

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.  
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." 3540 Victoria (3 lines).

**Welding Repairs—**

Barimar, Ltd., 10, Poland Street, W.1. "Bariquamar, Reg, London." Gerrard 8173.  
The New Welding Co., 26, Rosebery Avenue, London, E.C.1. "Windoneeda, Holb, London." Holborn 5252.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." 3540 Victoria (3 lines).

**Wind Shields—**

Auster, Ltd., 133, Long Acre, W.C. "Win-flector, London." Regent 5910.  
London Label Co., Ltd., Hadley Works, Beckett Road, E.16. "Nonflamoid" Nonflammable Celluloid. "Lonlabel, Canning, London." East 1300.

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

**Wire Gauze—**

N. Greening & Sons, Ltd., 16, Finsbury St., London, E.C.2. "Setscrew, Finsquare, London." London Wall 1082.  
Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

**Wires and Cables (Aeroplanes)—**

Bruntons, Musselburgh, Scotland. "Wire-mill, Musselburgh." Musselburgh 28.  
Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466 (3 lines).

**Wirework—**

Terry Herbert & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

**Wood Refuse Suction Gas Producers—**

Ruston Proctor & Co., Ltd., Lincoln, England. "Ruston, Lincoln." Lincoln 580.

**Woodworking Machinery—**

Robinson, Thomas, & Son, Ltd., Railway Works, Rochdale. "Robinson, Rochdale." Rochdale 467.

Sagar, J., & Co., Ltd., Halifax. "Sawtooth, Halifax." Halifax 136.

Wadkin & Co., Leicester. "Woodworker, Leicester." Leicester 3614.

**BLACK ENAMEL.**

**AEROPLANE GREY PAINT (flat).**  
**Oil and Petrol Resisting.**

**TRANSPARENT WOOD FILLER.**

**Subject to A.I.D. Inspection.**

# HARLAND'S

## VARNISHES, ENAMELS AND FINE COLOURS.

By Appointment to



His Majesty the King.

**MERTON, LONDON S.W.19.**

ESTABLISHED 1791.

**OPAL VARNISHES for AIRSOREWS and EXPOSED WOOD PARTS, &c.**

**WHITE DOPE RESISTING PAINT.**

**Subject to A.I.D. Inspection.**



## JOHN MACLENNAN & CO

Telegrams: "Yandua's Cent." 30/31, NEWCASTLE ST., LONDON, E.C.1 Telephone: City 9115.  
London. (And at GLASGOW.)

## TAPES. WEBS. CORDS.

MACHINE & HAND-SEWING THREADS, ETC.  
CONFORMING TO GOVERNMENT SPECIFICATIONS  
FOR AERONAUTICAL WORK.  
DELIVERY FROM STOCK.

CONTRACTORS TO H.M. GOVERNMENT

We make  
a  
Speciality  
of every  
Description

**NAME & ADDRESS PLATES**  
IN IVORY·IVORINE·BRASS  
GERMAN SILVER·COPPER  
TABLETS For ALL PURPOSES  
*Prompt Delivery Guaranteed*  
**ENDOLITHIC MFG CO LTD**  
*6 1/2 Fore Street*  
LONDON E.C.

of Plates,  
Gauges and  
Dials for  
Aeroplanes,  
etc., etc.

Write for our "A" List.





**TYPE C.C.A.**

## TANGENT

Self-Feeding      HAND TOOLS      Non-Distorting  
FOR CUTTING

### CORRUGATED SHEETS

PATENT.

These tools will cut sheets on any angle, limited curves and through the centre with no distortion of cut edges. Sheets can be cut to required shape when being fixed in position on the job. Made in two styles, as illustrated, for 20 awg. (weight 5 lbs.), with compound leverage for 18 awg. (weight 6 1/2 lbs.). Cuts 100% faster than any other hand method.

Write for Illustrated Pamphlet and Prices.  
**Montgomery, Smith & Co., Limited,**  
Patentees and Manufacturers,  
Tangent Wks., Keynsham, Somerset, Eng.



**TYPE C.C.B.**

Are YOU interested in Flying? If so, why are YOU not taking

**The Nottingham Flying and**  
**Correspondence Schools, Ltd., Course?**

The Imperial Flying Service Pilots say it is the Best in the Country.

Write for Particulars and Illustrated Book issued Free.

**32, KING STREET, NOTTINGHAM.**

'Phone 5766.

## A.G.S. WASHERS

Wire  
Work.

## THIMBLES

Turn Buttons.  
Eyelets.  
Washers.

## UNION NUTS & NIPPLES.

Tel.: 550 Central  
Tel. Ad.: BRISK, BHAM.

**W. H. BRISCOE & Co., Ltd.,**  
51, 52, 53, PARK STREET,  
BIRMINGHAM.

## R. F. & F. W. BROWN

(F. W. BROWN.)

Wollaton Saw Mills  
Near Nottingham

## ENGLISH ASH FOR AEROPLANES

### Bent Timber Manufacturers.

Telephone .. 1526 Nottingham.

Telegrams .. Browns, Sawmills, Wollaton.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# The "Guardian Angel" Parachutes



ALL IN THE DAY'S WORK.

## Aviator's Tragic Death.

"Whilst flying in an aeroplane in Hertfordshire, Sec.-Lieut. John Harding Greathead was killed, his machine catching fire."

—*Western Mail*, 14th Jan., 1918.

## Flying Men Killed.

"Taken ill in the Air."

"An inquest was held this morning at Hendon, on Francis Harry Varney Wise, of Banbury, Oxfordshire, and Alfred Payne, of Barry Docks, South Wales, both lieutenants in the Royal Flying Corps, Wise being a pilot and Payne an observer."

"Captain Clare, attached to the R.F.C., stated that on Sunday morning the men left the ground, and the machine reached a height of about 800 feet. It then took a left-hand turn and got into a spin and fell behind the sheds. He saw a cloud of smoke, and found that the petrol tank had burst, the men being burnt beyond recognition."

"He could not account for the accident. The only suggestion he could offer was that the pilot had been taken ill in the air."

—*Evening Standard*, 16th Jan., 1918.

## Aviator Crushed by His Machine.

"An inquest was held in Northumberland yesterday on Sec.-Lieut. Arthur F. Quelch (26), R.F.C. On Tuesday he was practising flying when the machine suddenly crashed to the ground, and he was crushed to death. A verdict of 'accidental death' was returned."

—*Yorkshire Post*, 18th Jan., 1918.

## Fatal Air Collision.

"An accident occurred in the vicinity of an aerodrome on Saturday which resulted in the death of three officers of the Royal Flying Corps. There was a collision in the air, and the two machines crashed to the ground from a considerable height, the airmen being killed instantaneously. Their names are—Second-

Lieutenants Lachlin Macdonald, who was piloting a single-seater, C. E. Rowley and W. R. Bailey, pilot and observer of the second machine. There was a strong breeze blowing at the time, and the atmosphere was rather hazy, but details are lacking as to how the machines came together."

"While an aeroplane was passing at a fair height over Martins Road, Shortlands, Beckenham, on Saturday, it collapsed in the air, a wing apparently doubling up, and the machine turning rapidly over and over, crashed on to the top of some houses. The occupant of the machine, Captain Shartless, R.N.A.S., when picked up was found to be dead."

—*The Daily Telegraph*, 21st Jan., 1918.

## Sportsman Killed While Flying.

"The amateur cross-country rider, Lieutenant George Heasman, was killed yesterday while flying on Salisbury Plain."

—*The Times*, 22nd Jan., 1918.

## THE LIFEBOAT OF THE AIR.

Neither life-belts nor lifeboats are able to save the lives of everyone at sea, and we do not pretend that the "Guardian Angel" Parachutes will save EVERY MAN who meets with disaster in the Air; but we do claim that their capabilities of instantly and automatically opening and bringing men down safely from extremely low heights must unquestionably save a very considerable percentage of the present deplorable fatalities. We believe that, when Aviators are trained in their use, and all are supplied with them, at least 50 per cent. of fatal casualties will be prevented. With increasing dexterity in their use, this percentage should gradually move up to 75 per cent. The Parachutes and Harness themselves, in principles, design and material, have for a long time been quite all right. We are now doing our best, to so adapt and attach the complete equipment to aeroplanes of all types, that accidents in its use may be rare. Our aim deserves, and are now receiving, encouragement at the hands of the responsible Authorities: and we deem it a privilege and delight to be able to perform this work for the Flying Services.

RELIABILITY—First.

RELIABILITY—Second.

RELIABILITY—ALL THE TIME.

## E. R. CALTHROP'S AERIAL PATENTS, LTD.

ELDON STREET HOUSE, ELDON STREET, LONDON, E.C.2.

Telephones (2 lines): London Wall 3266 and 3267.

Telegraphic and Cable Address: "Savemalivo-Ave-London."

# HANDLEY PAGE LTD.

CONTRACTORS TO  
THE ADMIRALTY  
AND WAR OFFICE


CRICKLEWOOD,  
LONDON, N.W.2.

HAMPSTEAD 7500 (9 lines).

"HYDROPHID, CRICKLE," LONDON

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





**The  
WIGHT  
SEAPLANE**

**J. SAMUEL WHITE & CO., LTD.**  
EAST COWES, I.W.  
BUILDERS OF  
"WIGHT" Type Aircraft, Fast  
Torpedo Vessels, etc., etc., etc.  
Telephone: No. 3 Cowes.      Telegrams: White, East Cowes.

**CONTRACTORS TO THE ADMIRALTY.**

Telegrams: "SUPERMARINE,"  
Phone: WOOLSTON 37.

ESTABLISHED 1912.

# The Supermarine

## Aviation Works Ltd

### Designers and constructors of Aircraft.

FLYING WATER & SLIPWAYS:  
**WOOLSTON**

H SCOTT-PAINE, GENERAL MANAGER.



OFFICES & WORKS:  
**SOUTHAMPTON**  
ENGLAND.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# WARING & GILLOW LTD.

**CONTRACTORS  
TO THE  
WAR OFFICE AND ADMIRALTY.**  
**LIVERPOOL      HAMMERSMITH      LANCASTER**



**HEAD OFFICE  
OXFORD STREET  
W.1**

**TELEPHONE No.:  
HAMMERSMITH 1980**

**TELEGRAMS:  
"Warings Factories, Hammersmith."**

Telephones: DALSTON 872.

LONDON WALL 9766.

HAMPSTEAD 4768.

## Thames Aviation Works (BURTON'S, LTD.)

**TWO COMPLETE MILL PLANTS AND TWO YEARS' EXPERIENCE.**

**Erecting Shops and Saw Mills:  
(Addresses may be had on application.)**

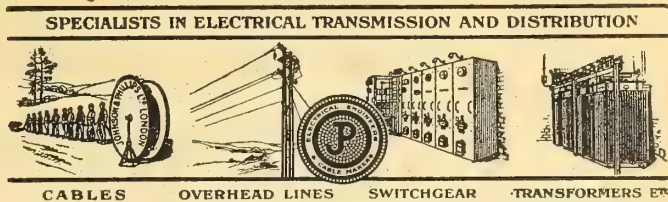
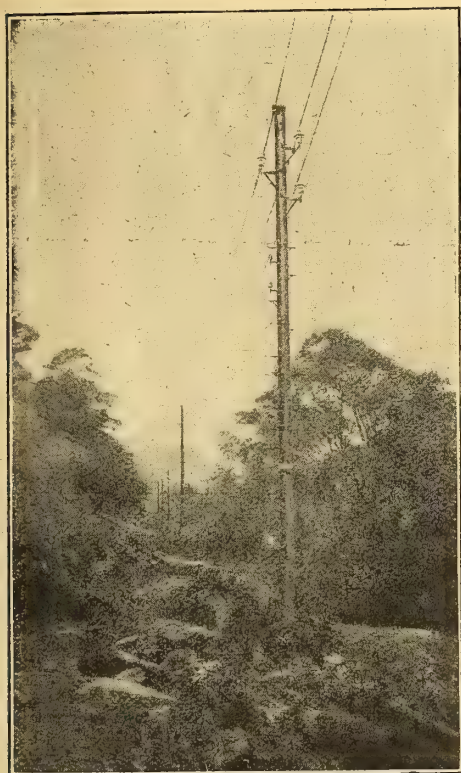
**Offices only: 141, CURTAIN ROAD, E.C.**

**CONSTRUCTORS OF COMPLETE AIRCRAFT**

**And all kinds of WOOD PARTS, WINGS, AILERONS,  
— STRUTS, LEVERS, RUDDERS, NACELLES, &c. —**

**Specialities—BIG STUFF and BEST WORK.**





*The Illustration shows a section of a 20,000 volt three-phase overhead*

## ELECTRIC POWER TRANSMISSION LINE

*lately completed by us for an outlying Government Mine.*

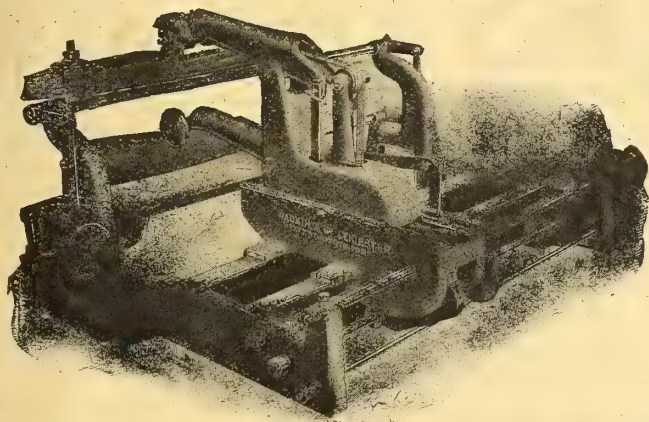
*The cheapest method of delivering power to Works, etc., in country districts.*

12, UNION COURT, OLD BROAD ST., LONDON, E. C. 2.

**JOHNSON AND PHILLIPS LTD**  
ELECTRICAL ENGINEERS & CABLE MAKERS  
**CHARLTON, LONDON, S.E. 7.**

BIRMINGHAM CARDIFF GLASGOW MANCHESTER NEWCASTLE-ON-TYNE PORTSMOUTH  
206, Corporation St. 9, Park Place, 159, W. George St. 231, Deansgate 44b, Blackett St. Cleveland Rd. Gosport.

# INCREASE YOUR Propeller Output!



Automatic Propeller Shaper, K.E.

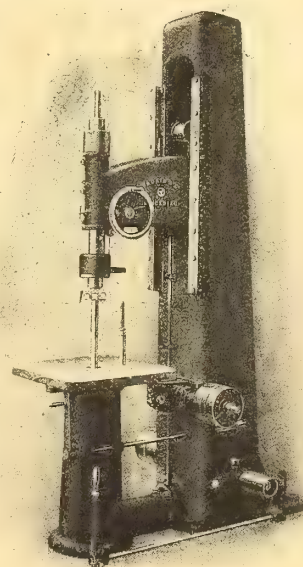
Some Advantages  
of our Shaper.

Every blade identical.

Less balancing  
required.

No scraps through  
careless shaping.

Work performed in a  
fraction of the time  
taken by hand.



Propeller Boring & Recessing Machine, K.A.

WRITE FOR LIST OF USERS.

Sole Makers and Patentees:



# WADKIN & CO. LEICESTER

Telegrams: "WOODWORKER," Leicester.

Telephones: 3614 and 3615.



**Firth's**  
"Speedicut" High-Speed Steel  
For turning Tools.

"Speedicut" Milling Cutters  
and Drills  
For all workshop purposes.

Thos. Firth & Sons Ltd.,  
Sheffield.

# **VICKERS LIMITED.**

Contractors to the  
**WAR OFFICE AND ADMIRALTY.**

**Aviation Department, Imperial Court,  
Basil Street, Knightsbridge, S.W.3.**

Telephone No.—  
KENSINGTON 6810 (2 lines).



Telegraphic Address—  
VICKERFYTA, KNIGHTS, LONDON.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



(Continued from page 484.)

inclusive, shall have a permissible variation of 12 per cent. above size; cable having a diameter of 0.125 ( $\frac{1}{8}$ ) to 0.187 ( $\frac{3}{16}$ ) inch (3.18 to 4.76 mm.), inclusive, shall have a permissible variation of 10 per cent. above size; and cable having a diameter of 0.2187 ( $\frac{7}{32}$ ) to 0.375 ( $\frac{3}{8}$ ) inch (5.56 to 9.53 mm.), inclusive, shall have a permissible variation of 7 per cent. above size.

**7 x 19 EXTRA FLEXIBLE STEEL-WIRE CABLE.**—(d) There shall be no permissible variation in diameter below size. Cable having a diameter of 0.125 ( $\frac{1}{8}$ ) to 0.187 ( $\frac{3}{16}$ ) inch (3.18 to 4.76 mm.) inclusive, shall have a permissible variation of 10 per cent. above size; and cable having a diameter of 0.2187 ( $\frac{7}{32}$ ) to 0.375 ( $\frac{3}{8}$ ) inch (5.56 to 9.53 mm.), inclusive, shall have a permissible variation of 7 per cent. above size.

#### SPECIFICATIONS FOR MILD CARBON STEEL TUBES.

**GENERAL.**—1. The general specifications 1G1. shall form according to their applicability, a part of these specifications.

**USE.**—2. These tubes are suitable for all parts not heavily stressed, such as trailing edges and elevators.

**MATERIAL.**—3. The I.A.S.B. standard steel No. 1020 shall be used. The composition is as follows:—

	Per cent.
Carbon .....	0.15—0.25
Manganese .....	.30—.60
Phosphorus, maximum .....	.045
Sulphur, maximum .....	.050

**MANUFACTURE.**—4. The tubes are to be of the cold-drawn, seamless type and are to be furnished annealed.

Any tube may be rejected at any time because of injurious defects or faults in the steel which are revealed by manufacturing operations, notwithstanding the fact that it has previously passed inspection. Such rejected material shall be returned to the manufacturer at the latter's expense. This clause shall not apply to materials fabricated after export.

**WORKMANSHIP AND FINISH.**—5. The tubes are to be smooth, of the section specified, and within the permissible tolerances as to wall thickness, of uniform diameter, free from scale, dirt,

specks, longitudinal seaming, lamination, grooving, and blistering, both internally and externally.

**PHYSICAL PROPERTIES AND TESTS.**—6 The tubes shall have the following physical properties:—

#### TENSILE TEST.—(a)

Minimum tensile strength, 60,000 pounds per square inch (42.18 kg./mm.<sup>2</sup>).

Minimum yield point, 36,000 pounds per square inch (25.31 kg./mm.<sup>2</sup>).

Minimum elongation, 25 per cent. in 2 inches (50.8 mm.) or 10 per cent. in 8 inches (203.2 mm.).

**CRUSHING TEST.**—(b) The test specimen shall be crushed end-wise until the outside diameter is increased in one zone by 25 per cent., or until one complete fold is formed. The specimen shall stand this treatment without cracking.

**SELECTION OF TEST SPECIMENS.**—7. One test specimen for the tensile test shall be chosen from every 400 feet (121.9 m.) of tubing and one test specimen for the crushing test from every 100 feet (30.5 m.) of tubing.

The specimens for the crushing tests shall have a length of 1.5 times the diameter of the tube.

Whenever possible the selection of test specimens shall be made by heats.

**DIMENSIONS AND TOLERANCES.**—8. (a) The following tolerances will be allowed on the outside diameter of tubes:—

Tubes under 1.5 inches (38.1 mm.) diameter,  $\pm$  0.003 inch (0.08 mm.).

Tubes over 1.5 inches (38.1 mm.) diameter,  $\pm$  0.005 inch (0.13 mm.).

The manufacturer and purchaser shall agree upon tolerances for couissant or telescoping tubes.

(b) The variation in wall thickness may be  $\pm$  10 per cent. of the dimensions specified.

(c) In no part of any tube shall the departure from straightness exceed 1 in 600.

**DELIVERY, PACKING, AND SHIPPING.**—9. All tubes shall be well oiled and delivered in boxes not exceeding 220 pounds (100 kg.) gross weight.

## COMMERCIAL AVIATION IN ITALY.

Now that our alliance of civilised peoples is to have an allied aerial army—I speak on the authority of the Italian High Commissary—we shall have to get on with standardisation of weights and dimensions, even if divergences in design for local pride's sake be still left us.

Under the control of the aforementioned Under-Secretaryship and its live staff of heads responsible for the departments of the Ministry, things look like getting a really mighty push on. Every effort to obtain men of certain vocations from the armies to work as aero motormen is being made, a sound heart in man and machine being the ideal aimed at.

The Chiribiri firm, one of the oldest in the trade here and the first to fly a machine successfully with their own engine, is extending its works very considerably even for these mushroomy times. Another firm, well known in England, of course, is hard at work on aero-engines. I refer to the Scat, of Turin.

Three fresh aerial ventures have recently got into the advertising stage. Firstly, the "Società Industrie Aeromarine Gallinari," with docks near Livorno—an established concern now entering the trade, I believe.

Also the "Società Adriatica Cos. Aeronautiche," presumably going in for seaplanes, with works at Ortona.

Lastly, a Milan Co., registered as of Lire 300,000 capital, and designated "Lavorazione d'Aviazione."

Gio Ansaldo is offering a new issue of shares for a small sum, at moderate terms. The firm has heavy backing, being supported by all bankers of clear vision. Several mines and smaller business concerns in Piedmont and elsewhere are now incorporated in the Co.—T. S. H.

## WANTED A LECTURER.

An organisation of high standing and possessing the most influential backing is very anxious to come across an ex-flying officer of either Service who would be prepared to deliver a series of lectures on aeronautics round the country. The pay will probably be good and the expenses allowance liberal, and, naturally, the officer who takes the job on will have an opportunity of making for himself a reputation in connection with aviation. Any invalided officers who think they would be capable of the work are invited to communicate with this office, and they will then be put in touch with the organisation in question.

## A CHANCE FOR A SCIENTIST.

A well-known aircraft factory is in want of a highly scientific designer, for choice one with a particular knowledge of air-screws, to assist in checking designs. Good money is offered. Those who wish for such a job are invited to apply in confidence to the Editor of this paper, marking their letters "M."

## COMMUNICATION WITH AIRCRAFT.

The following letter deserves attention:—

Sir,—A paragraph under this heading appeared recently in the Technical Press stating that a form of miniature searchlight operated by electricity and equipped with a telescope has been introduced recently by the French Army for signalling to aircraft. It may be of interest to your readers to know that this is not a very recent innovation and, in fact, a similar apparatus was introduced by this company in October, 1915. The apparatus is known as the "Chapman Hand Signalling Lamp," and is fitted with a sighting tube and handle. A self-contained Morse key and dry battery are carried on a waistbelt and connected to the lamp by a flexible lead. The projector of the "Chapman" lamp is designed to give the maximum signalling range with a minimum angle of dispersion as viewed from a distant station.

The "Chapman" lamp is being successfully used for communicating with moving objects, e.g., between aircraft and earth, or vessels in or approaching harbour where the need for secrecy precludes the use of non-directional mast-head lights. The entire equipment is extremely portable and light, weighing three and half pounds only.

(Signed) GRAHAM AND LATHAM, LTD.,

LIONEL J. GRAHAM, Director.

## THE CULTIVATION OF FLAX.

At the request of the Flax Control Board, the Board of Agriculture will endeavour to make arrangements for an extension of the cultivation of flax in this country during 1918, and for dealing with the resulting crop. For this purpose the Board have constituted, temporarily, a special branch, entitled the Flax Production Branch, and have appointed Mr. W. Gavin to be Director of Flax Production, Mr. Alfred Wood, F.C.A., Secretary to the British Flax and Hemp Growers' Society, to be Assistant Director, and Dr. J. Vargas Eyre to be Technical Adviser.

The Board have further appointed the following committee to assist the Board in the carrying out of such extended measures of flax production as requirements arising from the war may render necessary: Mr. P. Middleditch (Chairman), Mr. W. Norman Boase, Mr. H. I. Bowring, Mr. J. G. Crawford, Mr. H. E. Dale, Capt. R. Williams Ellis, Mr. R. Foster, Mr. W. Gavin, Mr. A. G. Gould, Mr. P. Guedalla, Mr. A. G. Lupton, Mr. James Mackie, Dr. R. S. Morrell, Mr. W. M. Oliver, Mr. Wyatt Paul, Mr. J. S. Pratt, Mr. C. Colman Rogers, Mr. W. S. Sykes, Mr. T. A. Wilson, Mr. A. E. Wheeler.

Mr. Alfred Wood has been appointed secretary to the committee.

The address of the Flax Production Branch is 14, Victoria Street, London, S.W.1.



**THE PATENTS INDEX.**

The subjoined list of recent inventions has been specially compiled by THE AEROPLANE from the current Official Patents Records.

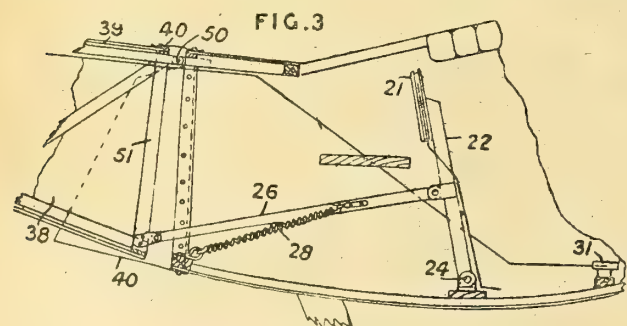
**PATENT APPLICATIONS.**

- Alexander, F. W. Level for aircraft, ships, etc. No. 824. Jan. 14th.  
 Alexander, F. W. Level for aircraft, ships, etc. No. 931. Jan. 16th.  
 Burton, J. Aircraft. No. 959. Jan. 17th.  
 Collyer, C. R. Propellers. No. 808. Jan. 14th.  
 Couldridge, T. Parachutes. No. 1044. Jan. 18th.  
 Crawford, A. E. Aeroplanes, etc. No. 916. Jan. 16th.  
 Curtis, G. R. Clinometer, with magnetic compass, for aircraft. No. 851. Jan. 15th.  
 Fawley, W. Semi-perpetual motion for aeroplanes, trains, trams, ships, etc. No. 781. Jan. 14th.  
 Fellows, G. Propellers for aeroplanes, etc. No. 800. Jan. 14th.  
 Freeman, G. Aeroplanes. No. 943. Jan. 17th.  
 Gibbons, F. J. J. Apparatus for releasing bodies from aircraft. No. 873. Jan. 15th.  
 Hall, J. I. Instruments for aircraft to indicate or record motions or time of flight. No. 1045. Jan. 18th.  
 Laing, C. A. Manufacture of aeroplane propellers. No. 820. Jan. 14th.  
 Layton, J. Device for indicating level of aeroplane. No. 878. Jan. 15th.  
 Letord, E. Radiator screen for aircraft. No. 930. Jan. 16th.  
 Letord, E. Radiator screens for aircraft. No. 999. Jan. 17th.  
 Lytton, E. Drift-meters for use on aircraft, etc. No. 953. Jan. 17th.  
 McGregor, L. J. Means of preventing conflagration of liquid fuels in tanks, etc. No. 990. Jan. 17th.  
 Moston, J. Aircraft. No. 1028. Jan. 18th.  
 Park, E. W. Aerial bombs. No. 923. Jan. 16th.  
 Railton, J. Clinometer for use on aircraft. No. 1130. Jan. 19th.  
 Roesch, G. Radiators for engines of craft driven by propellers operating upon air. No. 1066. Jan. 18th.  
 Short, H. O. Floats or boats for flying-machines. No. 796. Jan. 14th.  
 Short, H. O. Floats or boats for flying-machines. No. 798. Jan. 14th.  
 Short, H. O. Instrument for indicating rate of ascent or descent of aircraft, indicating revolutions of or controlling engines, or indicating speed of vehicles. No. 797. Jan. 14th.  
 Smith, T. W. Double aero-piston and cylinder. No. 1102. Jan. 19th.  
 Soc. Anon. l'Helice Integrale. Aeroplanes. No. 871. Jan. 15th.  
 Tarrant, W. G. Struts for aircraft. No. 926. Jan. 16th.  
 Thompson, G. W. Instruments for ascertaining angle of flight of aeroplane, etc. No. 1134. Jan. 19th.  
 Wills, W. Aero-level meter. No. 912. Jan. 16th.
- COMPLETE SPECIFICATIONS ACCEPTED, PRINTS OF WHICH CAN BE OBTAINED ON AND AFTER FEBRUARY 7TH, 1918.
- 112,472. Oct. 4th, 1916. Taylor, I. F. and Pick, S. Bombs or the like for use on aircraft.  
 112,483. June 1st, 1917. Wheatley, R. Fabric for aeroplanes, kites, and the like, and the method of manufacturing and after treating same.  
 108,155. June 24th, 1916. Roesch, G. Liquid-fuel containers more especially intended for use on aircraft.

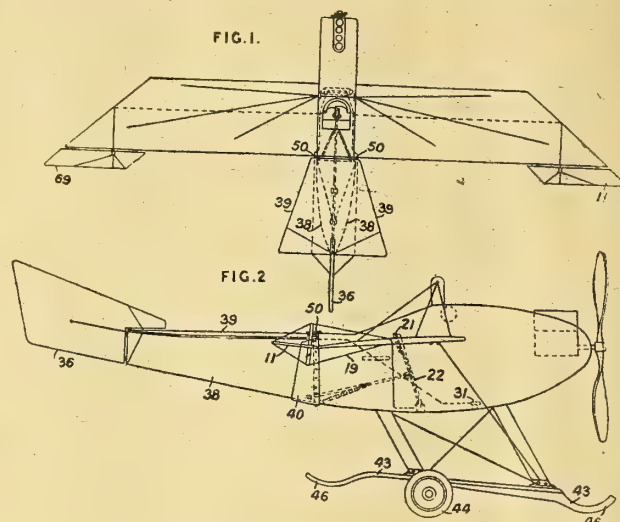
**ABRIDGMENTS OF RECENTLY PUBLISHED SPECIFICATIONS.**

**111,300. Aeronautics.** TIMSON, R. P., Nahant, Massachusetts, U.S.A.

**AERIAL MACHINES WITHOUT AEROSTATS; CARS AND CABINS; FRAMEWORK.**—Aeroplanes are constructed with the centre of gravity in front of the centre of pressure, and with the rear



part of the fuselage detachably hinged at the rear of the main planes and adapted to act as an elevator. The rear part 38 of the fuselage is hinged at 50 and works within a shield 40 projecting from the front part of the fuselage, an elevator 39 being formed at the top of the part 38. The hinges 50 comprise plates 62, 63, Fig. 8, fixed to the two parts of the fuselage and connected together by a detachable pin 65. The rear part 38 of the fuselage is of streamline form and comprises a central



braced frame 51, 53, 58, Figs. 5 and 6, connected by cross-bars 57, 60 to side members, the whole being covered with canvas.

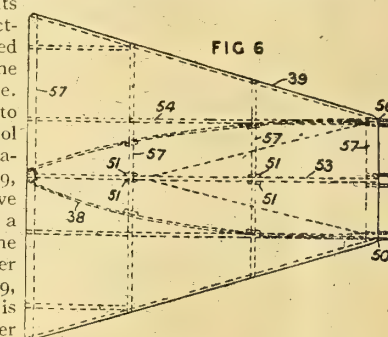
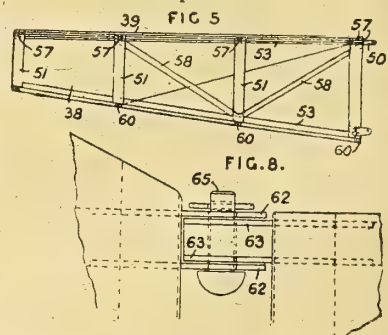
**PLANES, CONSTRUCTION OF.**—The main planes are flat on the underside and convex on the top, and have their outer edges diverging rearwardly, Fig. 1. The elevator 39 is formed by extensions of the upper members 54, 57, Figs. 5 and 6, of the rear fuselage framework, and is detachably hinged at 50.

**STEERING AND BALANCING.**—The elevator 39, formed on the rear part of fuselage and hinged at 50 as described above, is normally set at a negative angle and is actuated by movement of a lever 22, Fig. 3, about its pivot 24, a rod 26 connecting the lever to the braced central frame 51 of the rear part of the fuselage. Springs 28 connected to the rod 26 further control the position of the elevator. The ailerons 11, 69, also set at negative angles, are operated by a hand-wheel 21 on the lever 22 and are further controlled by springs 19, Fig. 2. The rudder 36 is operated by a foot-lever 31, Fig. 3.

**LAND WHEELS AND SKIDS.**—The land wheels 44, Fig. 2, are arranged under the normal centre of pressure and are carried by a skid bar 43 provided with front and rear skids 46.

**111,312. Aeronautics.** CALTHROP, E. R., Eldon Street House, Eldon Street, London.

**PARACHUTES.**—Parachute-launching devices of the kind described in Specification 21312/14 are provided with means for shielding the nested parachute from undesirable air pressures. The parachute is assembled upon a disc 1 as described in the Specification referred to and is protected by a second disc 3 spaced from the disc 1 by a cylinder 4 and secured by bolts 5. A millboard disc 7, over which is forced a flanged cap 7<sup>1</sup>, is interposed between the cylinder 4 and the disc 3, and above the disc 3 is a disc 7<sup>2</sup> having a flanged aperture 8 closed by a cap 9 to form a recess in which a book of instructions may be carried. The discs 1 and 3 are strengthened by cycle-rims 11 spun into





# GWYNNES

LIMITED

CONTRACTORS TO H.M. ADMIRALTY AND WAR OFFICE.

SOLE LICENSEES AND MANUFACTURERS IN THE BRITISH EMPIRE  
OF THE

"CLERGET" PATENT AERO ENGINES.



WORKS & OFFICES: { CRISP ROAD, HAMMERSMITH, W.6. } LONDON.  
                                  { CHURCH WHARF, CHISWICK, W.4. }

TELEPHONES: 1910 HAMMERSMITH (3 lines).  
                  1780 CHISWICK (3 lines).

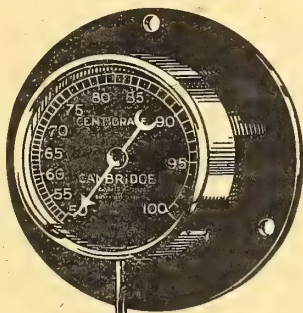
TELEGRAMS: "GWYNNE, LONDON."

## THE CAMBRIDGE SCIENTIFIC INSTRUMENT CO. . . LTD AEROPLANE

Length of Scale 4"  
Diameter of Dial 2"  
Weight with 10ft of  
Copper Tubing 16ozs.

Length of Copper  
Tubing and Tempera-  
-ture range to Cust-  
-omer's requirements.

RADIATOR



THERMOMETER

Manufacturers of all  
Types of Temperature  
Measuring Instruments  
for Industrial and . . .  
Scientific purposes.

## CAMBRIDGE ENGLAND

also  
Aeronautical Instruments  
Engineering Instruments  
Electrical Instruments  
Physical Instruments  
Physiological Instruments

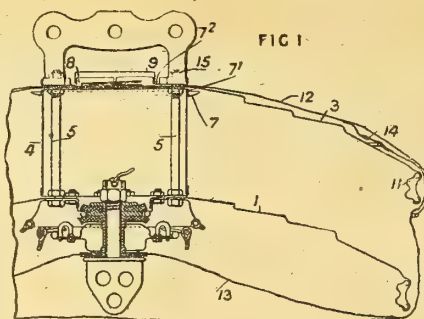
Telegram: INSTRUMENT CAMBRIDGE

Telephone: CAMBRIDGE No 615 (2 lines)

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



the edges. The upper and lower covers 12, 13 are laced together with worsted or other readily rupturable material at 14 which may be sealed to prevent unauthorised tampering with the parachute. To enable the parachute to be reassembled on the disc 1, the disc 3 is removed after undoing the nuts 15.



**111,308. Air-speed indicators.** CLIFT, E. H., 95, Castelnau, Barnes, London.

Relates to indicators of the kind in which a pressure gauge is actuated by the air passing through a Pitot tube, and consists in arranging for an audible signal to be given when the speed of the aircraft falls below a predetermined rate. The pressure diaphragm *b* carries a boss *h* which, at a predetermined pressure, contacts with a spring finger *e* and forces the contact point *e*<sup>1</sup> away from a second point *m*<sup>1</sup> carried by the finger *m* and so breaks

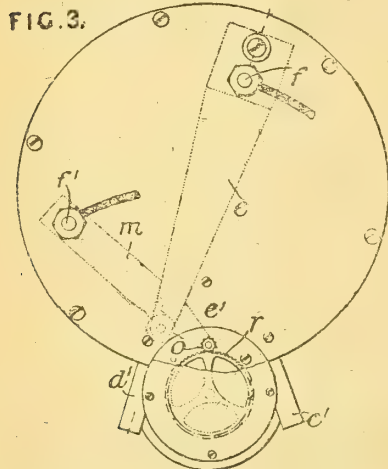
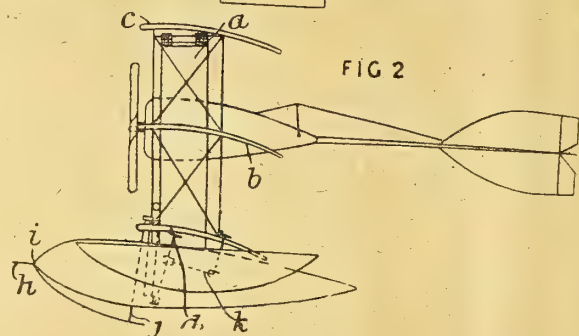
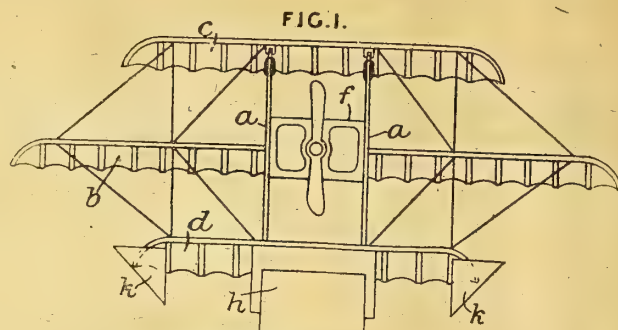
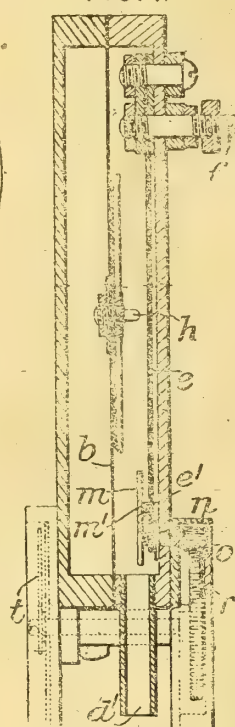


FIG. 4.



an electric circuit passing, by way of the terminals *f*, *f*<sup>1</sup>, through a buzzer. Normally, when the aircraft is in flight, the circuit is broken, but when the speed falls too low, the buzzer gives an alarm. By means of a screw *n*, pinion *o*, and wheel *r* fitted with an indicator *t*, the alarm can be set to any desired speed. The diaphragm *b* may operate a visual speed indicator also. The ends of the pressure and static tubes *c*<sup>1</sup>, *d*<sup>1</sup> are located in the slip-stream of the propeller.

**111,303. Aeronautics.** SOC. R. BOURBEAU AND DEVAUX, H., 32, Rue Felicien David, Paris. Not yet accepted. Abridged as open to inspection under Sect. 91 of the Act.

**FLOATS AND HYDROVANES, ARRANGEMENT OF; SHOCK OF LANDING, DEADENING.**—A waterplane has laterally inclined surfaces *h* mounted at the ends of the planes or independently of the planes to prevent tilting of the machine when in motion on the water. They may also serve for balancing a stationary machine by forming them as convex-inclined outer surfaces of floats having flat inner surfaces. A flexible surface *h* is hinged to the body of the machine at *i* and supported at its rear end by two props *j* extending through the body and elastically connected to it by rubber rings. The surface *h* is folded back against the fuselage during flight.

**AERIAL MACHINES WITHOUT AEROSTATS; PLANES, ARRANGEMENT OF; PROPELLING; TANKS, ARRANGEMENT OF.**—Two flat streamlined uprights *a* extend up from the body and support a main plane *b* and its bracing and may also support upper and lower planes *c*, *d*. The engine, tanks, and rear parts of the machine are supported between the uprights *a* by stamped-metal members *f*.

## A SOLUTION OF THE SILVER SPRUCE PROBLEM.

If our ancestors hundreds of years ago could have foreseen the future of aeroplane construction, and if they had not been affected with the improvidence natural to the human race, they would have planted trees, and especially silver spruce—by the hundred million.

To-day in this country there is a famine in woods suitable for aircraft, but particularly in silver spruce, chiefly because of transport troubles. The man who could produce synthetic silver spruce, or its equivalent, would be a national benefactor.

It is, however, possible that this problem has been solved. If one cannot get enough 50-ft. lengths of flawless silver spruce, it is at least possible to use hollow spars built up of that wood to any length, size or shape that is desired. Spars and struts of all lengths and shapes have already been tested and proved to be equal, and more than equal, to the best qualities of the solid wood.

The present methods of applying silver spruce to aircraft construction are very wasteful, when some 50 per cent. of the wood has to be cut out to get the requisite degree of lightness for struts and spars.

Instead of this wasteful method the hollow spars made by the Robert Young's Construction Company are built up of thin veneers glued together to the desired section, strength and shape, to any length, without joints. No matter what the length of the desired spars may be, no scarfing or other joint is required. These spars are one continuous length of uniform strength. The necessary provision for bolts and all other fixings required for wireless installations, etc., are provided for in the building up of the spar.

The same methods are adopted for building up the heavy bearers for engines, etc., and this is accomplished in a more satisfactory form than can be done at present with solid wood.

Shaped struts are built up with thin veneers to the required shapes. These are of streamline section, and the important point to grasp is that they are shaped at the ends to fit all the stampings now in use for ordinary struts, so that no alterations in the machines in this respect are necessary.

These struts and spars are all reinforced in their interior construction in such a way as to give the greatest resistance to all stresses and strains without adding to the weight. The most searching tests have proved that these hollow spars give a greater efficiency than any solid silver spruce spar. They have successfully passed the humidity tests, and are reliable in all climates.

There is no limit to the application of this method of manufacture for all parts of aircraft work for which spruce is now used, and with equally satisfactory results. All spars and struts are made of English woods, a fact which will mean much in the future saving of transport now used for silver spruce, and which may, therefore, be employed for other purposes.

This invention is the property of the Hollow Structure and Aircraft Co., Ltd. The Robert Young's Construction Co., Canonbury Works, Essex Road, N., are the exclusive makers and licensees.





# ARMSTRONG, WHITWORTH

## AIRCRAFT WORKS,

### NEWCASTLE ~ UPON ~ TYNE.



TELEPHONE :- 500 GOSFORTH.

TELEGRAMS :- ARMSTRONG AVIATION,  
NEWCASTLE ~ ON ~ TYNE.

# Rotax

## ROTAX AEROPLANE FITTINGS and ROTAX MOTOR ACCESSORIES

are both made with the same degree of accuracy and reliability that Government requirements call for and service conditions demand.

Special Catalogue of Aero Fittings just published sent on application. Specialities—Electrical Equipment, Streamline Wire and Fittings—Brass and Gunmetal Fittings etc., etc.

The ROTAX MOTOR ACCESSORIES Co., Ltd.

HEAD OFFICES—

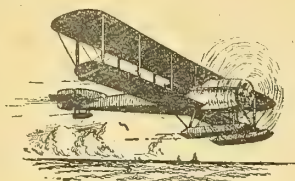
Rotax Works, Willesden Junction, N.W. 10.



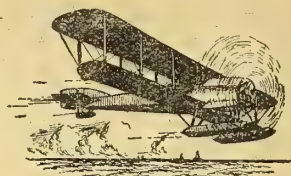
KINDLY MENTION "THE AEROPLANE"

WHEN CORRESPONDING WITH ADVERTISERS.





**JOSEPH EVANS & CO., LTD.**  
LIVERPOOL STREET MILLS,  
BIRMINGHAM.



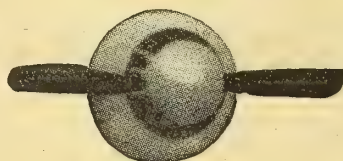
Manufacturers of  
**COMPONENT PARTS USED ON**

**AERO ENGINES & AIRSHIPS.**  
**SHORT and FAIREY SEAPLANES.**

SPAD and H. FARMAN.

**D.H. MACHINES.**

**SOPWITHS.**



**FLYING BOATS.**

**AIRSCREWS.**

TELEPHONE : CENTRAL 733.

TELEGRAMS: "ADEPT, BIRMINGHAM."

**Contractors to the Admiralty and Air Board.**



**THE**  
**CENTRAL AIRCRAFT COMPANY**

**DESIGNERS AND CONSTRUCTORS**  
**OF AIRCRAFT.**

**Office and Works :**

Telegrams: Aviduction, Phone, London.

Telephone: Hampstead 4403, 4404.

**KILBURN, N.W. 6.**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# AIRCRAFT FINANCE

## CURRENT TOPICS.

### DIRECTORS' POWERS TO REFUSE TRANSFERS.

From time to time important questions arise as to the right of directors to refuse to give effect to the desire of a shareholder either to dispose of his holding or to transfer the whole or part of his shares by way of sale to others. "Qui vive" writes from "Somewhere in France," to inquire what is his proper course of action in the following circumstances. Prior to joining His Majesty's Forces, he was a director of a private company. In his absence he fears the business may suffer, and he is anxious to realise his holding for which he has received an offer.

The directors, however, relying upon a section of their own Articles of Association which provides as follows:—"The directors and managers . . . may decline to register the transfer of any fully paid-up share or shares on certifying that in their opinion it is contrary to the interests of the company that the proposed transferee should be a member thereof," refuse to transfer the shares, replying that they had resolved that, "in the absence of the transferor, the admission of the transferee as a member of the company would be contrary to the interests of the company," and they had endorsed the transfer with the following words:—"The directors in refusing to act upon this transfer, do not in the slightest degree reflect upon the personal character or financial standing of the transferee."

Many points affect the issue, but a recorded action which may be regarded as a reliable precedent was decided a short time ago on the very point by Mr. Justice Eve.

In giving judgment his Lordship pointed out "that the right of transferring shares was absolute, except in so far as it might be restricted by a contract 'inter socios,' such as Articles of Association frequently contain. He thought that the Article quoted above would not enable the directors to refuse registration merely because they thought the transferee might be the trustee to the transferor. Nor did he think that they could refuse registration if they regarded the transfer merely as a device to multiply the number of persons supporting a particular policy. He thought, however, that the directors could refuse registration under the powers of the Article if, in their opinion, the transferee would be placed in a position which would enable him to obtain information contrary to the interests of the company."

"His Lordship thought, however, that in this case the directors had ignored the personnel of the transferee. They merely looked upon the nominees as persons who might adopt a hostile attitude towards the company. But in his Lordship's opinion the fact that the transferor might have ulterior motive did not justify the refusal of the directors to register. He did not consider that under the powers conferred in the Article it was reasonable to refuse to register a transfer of a single share. It might be so in the case of small private companies, but not in this case. Therefore, he ordered the directors to place the transferee's name on the register and to pay the costs of the motion."

The rule as generally understood is that, if the company's Articles of Association confer the discretion of rejection upon the directors, the Court will not interfere with their exercise thereof, unless it can be shown that they are acting "corruptly, or fraudulently, or arbitrarily, or capriciously, or wantonly." It may not be exercised for a collateral purpose. (Chitty, J., in *Bell v. Bell*, 65 L.T., 245.) If the Court decides that the discretion has been exercised in good faith, it will decline to pass it in review.

If the directors give no reasons for the rejection, and if they explicitly decline to state their reasons upon a challenge in court to do so, the Court will still refrain from interference, always assuming it is satisfied, upon the facts within its knowledge, that they acted "bona-fide."

But if the directors state their reasons, either in court or outside, they will then be subjected to judicial scrutiny. If they are legitimate reasons the Court will not over-rule them, even though it would itself have acted differently if it had stood in the directors' shoes. "But if they are not legitimate, as, for instance, if the directors state that they rejected the transfer because the transferor's object was to increase the voting power in respect of his shares by splitting them among his nominees, the Court would hold that the power had not been duly exercised. So, also, if the reason assigned is that the transferee's name is Smith, or is not Bell." (*Bell v. Bell*, supra.)

In the *Coalport China* case (1895, 2 Ch. 404) directors decided

that the registration of transfer should be refused, but assigned no reason for their decision. They had, under the Articles, a power to refuse registration. Mr. Justice Kekewich decided that if their action was challenged it was for them to justify it. "Now that," said Lord Justice Lindley, on the successful appeal, "appears to me to be wrong. It is for those who say that the directors have exercised their power improperly to give some evidence to that effect." Such is the law upon this important point of detail, and directors will do well to give the subject some consideration.

G. A.

## COMPANIES OFFICIAL NOTICES.

### MORTGAGES AND CHARGES.

DAVIDSON AVIATION CO., LTD., London. Registered Jan. 8th, 1918. Debenture general charge on the company's assets, £15,000.

JACKSON AIRCRAFT CO., LTD., London. Registered Jan. 2nd, 1918. Mortgage to London and Provincial Bank, Ltd., charged on all moneys due or to become due under a contract with the Ministry of Munitions.

### SATISFACTIONS.

DAVIDSON AVIATION CO., LTD., London. Satisfaction registered Jan. 8th, 1918. £5,000 (not ex) registered Aug. 10th, 1916, and £5,000 registered Aug. 10th, 1916.

PAGE (HANDLEY), LTD., London. Satisfaction registered Jan. 8th, 1918. £400 registered Dec. 21st, 1910, and March 8th, 1913.

### NEW COMPANIES.

MIDLAND MOTOR CYLINDER (ALUMINIUM) CO., LTD. (149,408). Private Company. Registered Jan. 18th. Capital £10,000 in £1 shares. Motor cylinder casters, general founders in aluminium and other metals and alloys, manufacturers of and dealers in motors, cycles, aeroplanes and aircraft, etc. The subscribers (each for 100 shares) are:—

H. H. B. Pearce, 38, Sandon Road, Edgbaston, ironfounder.

A. E. Pearce, 38, Sandon Road, Edgbaston, ironfounder.

P. Pritchard, 12, Melville Road, Birmingham, ironfounder.

The first directors are:—H. H. B. Pearce, A. E. Pearce, and P. Pritchard (all permanent). Solicitor: F. Chapman, 185, High Street, Smethwick.

## ANSWERS TO CORRESPONDENTS.

FLEUR DE LYS (Paris).—There is nothing to prevent directors issuing debentures below their nominal face value. The Companies Acts enforce payment in full for shares, but this does not apply to debentures which rank in the category of loans charged against assets, and may be cancelled by redemption according to the terms of the bond.

"SECRETARY."—Where there are joint holders of shares the practice is to send the dividend warrant or cheque to the first of such persons named in the register of members, and to make it payable to his order.

J. E. D.—The company will no doubt issue a new share certificate to you to replace that lost, but the directors may demand evidence of its loss or destruction, and also will, no doubt, require you to make and sign a formal declaration of indemnity against any loss or claim resulting from issuing such new certificate. The company are also entitled to make a charge for the new certificate, which usually is 2s. 6d.

[Owing to pressure on space the list of Market Quotations is omitted.—Ed.]

## THE AEROPLANE BLUE BOOK AND AIRCRAFT COMPANIES FINANCE.

Those interested in the finances of the industry will be glad to learn that the Aeroplane and General Publishing Co., Ltd., are about to publish the Aeroplane Blue Book, a Directory of Aircraft Finance, 1918.

This work will supply a keenly felt want. Many have experienced difficulty in obtaining information of a reliable character regarding the many financial points affecting the companies in which they are interested. There are many other details equally important that otherwise would be extremely difficult to obtain without considerable trouble.

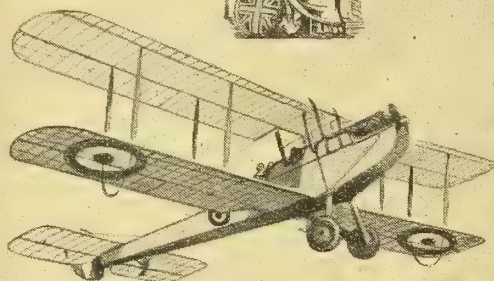
The Aeroplane Blue Book will no doubt meet with a big demand. The date of its publication will be announced shortly.



# Britannia Dope

TRADE

MARK



## Britannia Dopes (NON-POISONOUS) and Varnishes

FOR AEROPLANES  
AND SEAPLANES



FOR FULL PARTICULARS APPLY  
TO THE APPROVED MAKERS—

### ROBT. INGHAM CLARK & CO. L<sup>TD</sup>.

WALTER HOUSE,  
BEDFORD ST., STRAND, W.C.

Telegrams: "Pearline. Westrand."  
Telephone: Regent 3923.

WORKS .. WEST HAM ABBEY, E.15  
Telephone ... East 955 & 956

# PULVO

## RADIATOR SHUTTERS

*are, and will be, wanted in  
ever-increasing quantities.*

*Realising this, and in  
consequence of the very  
large orders we have  
recently undertaken for  
making various types of  
shutter, we have opened  
an additional department  
particularly to deal with  
this branch of work.*

*Write us to-day and let us  
quote for those you want.  
Prompt and regular de-  
liveries can be promised,  
and,*

**WHAT PULVO PROMISES  
PULVO PERFORMS.**

The PULVO ENGINEERING Co. Ltd.  
10, 12, 14 and 16, DANE STREET,  
HIGH HOLBORN, LONDON, W.C.1

Telephone :  
Holborn 410

Telegrams :  
Pulvipult, West-Cent.



# THE AIRCRAFT TRADER

## MARKET TOPICS.

(Prices are for quantities on usual terms.)

Jan. 24th, 1918.

**COPPER.**—There does not now appear to be any fear of a shortage of Copper. Supplies are very satisfactory, although in certain quarters there is a feeling that a substantial increase should still be effected.

As stated previously, the U.S. Authorities have now settled the question of price, and, although a few producers think the price should have been increased, the decision of the Government appears to have been fairly well received.

The home position remains unchanged.

### Comparative Prices.

To-day (Standard) .....	£110 0 0
Last Year .....	130 0 0
1916 .....	85 15 0

**TIN.**—Prices still continue very firm indeed, but supplies are still very uncertain. Although good supplies have been received recently, the outlook is very obscure. There does not appear to be any possibility of the market becoming easier for a few weeks yet; the fact that a number of old contracts have to be fulfilled will in itself tend to keep the price up.

The U.S. Government do not appear to be receiving sufficient supplies, and unless there is an improvement shortly the position there will be very serious indeed.

### Comparative Prices.

To-day, Jan. 23rd .....	£300 per ton.
Jan. 4th .....	280 per ton.
Highest Price this Month .....	300 per ton.
Highest Price, 1917 .....	205 per ton.

**LEAD.**—Supplies are not quite as satisfactory as they were a short time ago, but there should be a big improvement shortly. It is reported that the U.S. Authorities will shortly fix the price of Lead, and it is thought that the price will be between 6 and 6½ cents per lb. Prices here have, of course, been net since Jan. 1st, 1918.

**STEEL.**—The output of Steel continues to give satisfaction, and steady supplies are being received. There appears to be every indication that the colossal demands, which will be made for Aircraft Steels during the next few months, will be easily satisfied if the present rate of output is maintained.

Unfortunately, the above remarks do not apply to cast or high-speed steels, and the only sure way of securing supplies is for the aircraft factories to anticipate their requirements three or four months ahead.

Prices of aircraft steels continue unchanged, but cast steel continues to advance steadily.

**TIMBER.**—The question of supplies still continues to cause great anxiety. A few more shipments of silver spruce have recently been received, and a very fair quantity of one substitute has been received, but the demand is far in excess of the available supplies.

It is generally understood that the A.I.D. intend testing silver spruce substitutes with the object of ascertaining if the consignments conform to the silver spruce specification, and, if not, it will then be graded according to the result of the tests; but, as stated last week, it is difficult to see the necessity of grading the wood, seeing that the specification for substitutes does not state the particular parts or machines on which the various grades are to be used.

It is, of course, a waste of time testing either cypress or poplar, in order to ascertain if they will give the same results as silver spruce, and if 50 per cent. of the imports are graded as being only suitable for school machines, the situation will be worse than ever. Is there any reason why the substitutes cannot be used entirely on the school machines? It is quite certain that the rigid standard set for silver spruce substitutes to be used on fighters must be relaxed, otherwise there appears to be nothing to hinder a most serious shortage of wood and a consequent decrease in output. The situation wants clearing up, and it is about time definite instructions were issued.

It is interesting to learn that the Italian Government have placed contracts in America for many millions of feet of Douglas Fir for the construction of aeroplanes. It is stated that this wood will be used in place of spruce.

Mahogany imports have been rather light recently, and the demands are continually increasing; this, of course, affects the prices, which continue to advance.

It is painful, in view of the shortage of 3-ply, to write of the eccentricities and lack of common sense shown by some inspectors. Of course, they are the victims of impracticable instructions and cast-iron specifications. Why should hundreds of boards with a slight flaw in the middle or elsewhere be totally rejected? They would, if passed, probably be cut up into very small pieces for ribs, etc., and if there is the possibility that the constructor might use the board elsewhere, the majority of inspectors appear to have the impression that the constructor does not care a straw for the lives of our gallant pilots, and is out to hide faults, scamp work, or anything in order to get the output up. Why not grade them in four classes, i.e. :—

Grade A1 .....	Fighters' general use.
Grade A2 .....	Fighters' ribs, etc.
Grade B1 .....	School machines general use.
Grade B2 .....	School machines ribs, etc.

The price of Silver Spruce is now 17s. 6d. to 18s. 6d., c.i.f.

**FABRIC.**—The Authorities are endeavouring to conserve the stocks of Linen Fabric by insisting upon the use of a substitute on certain parts of machines; this is a step in the right direction, of course, but it is nearly too late, and should have been done long ago.

The Flax supply is not at all satisfactory and the outlook is far from promising. Perhaps it will be decided to use Cotton Fabric on School machines shortly! It is agreed that the shipping problem is against this modification; on the other hand, it must be admitted that the output of aeroplanes must not be held up this spring owing to the shortage of Linen Fabric.

**DOPE.**—It is not generally known that one of the most serious problems at the present time, in connection with aircraft construction, is the question of Dope supplies. The shortage is very, very serious, in fact some works have been entirely stopped in their doping shops owing to shortage of supplies. This situation has not developed suddenly, but has been looming in the distance for about six to nine months, and, like the majority of other difficulties, could have been overcome if it had been seriously tackled six months ago. It is naturally assumed that the Air Board knew what the nation's output of aeroplanes should be for the first six months in 1918, and there is very little doubt on this point. There should not, therefore have been any difficulty in making the necessary arrangements for the production of the necessary quantity of Dope. It is only about six to eight weeks ago since the authorities insisted that all firms building school machines must use a nitro-cellulose dope, the object being to reserve the output of acetate-cellulose dopes (of which there was a serious shortage) for fighters. Obviously this is a modification which should have been rigorously enforced at least four months ago.

It is understood that the present shortage is due not to raw materials, but to solvents, which are imported. It is difficult to say if the Department responsible for dope have been relying upon the assurances given from time to time that the submarine peril was overcome, but if this is the case then they alone are responsible for the terrible plight we are in at present. No one will dispute the fact that it is sheer madness to run the risk of having the country's output of aeroplanes impeded by taking chances. It would have been far more satisfactory to have made the necessary arrangements to have the solvents supplied here even if it would have resulted in the available supplies being fifty times greater than the requirements.

The outlook is not at all hopeful and the Air Board have got a very anxious time ahead. Every effort is now being made by them to overcome the shortage of supplies, but, so far, there does not appear to be much improvement.



### A STRONG COMBINATION.

Recently the present writer had the privilege of paying a visit to the works of the Gosport Aircraft Company, whose works are at Gosport, and at Southampton. Being comparative newcomers to aviation, one must not be more specific as to the locality of the firm's works, lest some far-raiding Hun should be informed as to the locality of a new and important target. One may, however, say that in their short existence as producers of aircraft the firm have done most remarkable work.

The business was started by Sir Charles C. Allom, the well-known yachtsman and the owner of "Istria," probably the most successful racing boat of her time, having won 91 races out of 100, and with him was, and is, associated Mr. Charles Nicholson, designer and builder of "Istria" and of "Shamrock IV.," and senior partner of the famous firm of Cowper and Nicholson, whom one may fairly call the premier yacht-builders of the world.

The works have been excellently organised by Mr. M. H. Volk, well known among aviators as the founder of the seaplane station at Brighton which did such good work before the war, and later as chief assistant to Mr. Gordon England in organising the works of Frederick Sage and Co., of Peterborough. Mr. Volk has been ably assisted in his task by Mr. D. McIntosh, formerly of White-Allom and Co., whose business experience has been of high value.

The Gosport Co. has been fortunate in securing the services, on the designing side, of Mr. G. A. Ashfield, who has held a responsible position in the design department of the Sopwith Company since some time before the war, and of Mr. P. Beadle, formerly with the late Mr. Cosland Perry in the Perry-Beadle firm, and later of the Norman Thompson Flight Co., Ltd. The sound practical experience and engineering ability of Mr. Ashfield and the originality of Mr. Beadle's ideas should form a valuable combination.

The Southampton branch works are in charge of Mr. King, formerly assistant works manager of the Norman Thompson, and here as at Gosport Mr. Volk has achieved remarkable success, which he attributes to the support given him by the staff and by the various shop foremen, who are most loyal and enthusiastic in their work.

The task of production has been complicated by the fact that all the hands were absolute novices at aircraft work and have had to be instructed in the elements of their jobs. While their education has been in progress the workshops themselves have had to be reconstructed, small shops intended for quite other tasks being rebuilt into big aircraft shops actually over the heads of the workpeople engaged both on instruction and production.

Quite wonderful work on the smaller parts of aircraft is being done by women-workers, and in certain cases heavy lathe work demanding real engineering ability—considerably greater than that possessed by many of the "indispensables" of the Amalgamated Society of Engineers—is being done by intelligent and well-educated women, one such worker being as good a tool-setter as one has seen. A special section of the works has been devoted by Mr. Volk to the training of girls as metal-workers. The system of training is his own and the results have been uniformly good.

Though so young in the Aircraft Industry, the Gosport Aircraft Co. has already turned out some remarkably good machines, which have been tested by Mr. Clifford B. Prodder, and pronounced by him, in the light of his long and wide experience to be first-class craft for their particular purpose. Altogether one foresees for the firm a brilliant future, not only as producers of war aircraft, but as designers and builders of commercial and sporting aircraft after the war, especially in connection with flying-boats, in which type of machine Mr. Nicholson's unique experience of the highest kind of yacht design is bound to be of extreme value.—C. G. G.

### LOST.

Mr. Clifford W. Tinson, of Frederick Sage & Co., Ltd., intimates that he has lost a pocket-case containing several barograph records of altitude flights, and his military papers. These were lost on Thursday, Jan. 24th, either on the G. W. Railway going to Bristol, or in Bristol during the following day—possibly in an aeroplane workshop. If any Bristolian readers of this note happen to come across the pocket-case or the barograph records, he will be doing a righteous act by communicating with Mr. Clifford W. Tinson, at 1, Cochrane Street, London, N.W.8.

### A BURBERRY SALE.

The proprietors of the firm of Burberry's, The Haymarket, S.W.1, announce their annual sale, which commenced on Jan. 1st, and will last until Feb. 26th, and draws attention to the exceptional opportunities which this sale offers for the acquisition of various of their exclusive garments designed for weather resisting. Any of the articles on sale can be obtained for half the usual price, and both Service and civilian readers of *THE AEROPLANE* will be well advised if they invest in some of the bargains which are to be had.

A leaflet catalogue will be sent to all those interested.

### THE CONTROL OF AIRCRAFT SUPPLIES.

A reader of *THE AEROPLANE*, closely concerned with the Aircraft Industry, writes, apropos the control of various materials, that since fabric and frayed tape have been controlled, certain manufacturers cannot get sufficient supplies. This, he points out, is merely a repetition of what has occurred in other instances where departments have taken over supplies, which, when left as formerly in the hands of the manufacturers themselves, could be obtained without excessive difficulty. The general opinion in the Industry is that if the Authorities require larger output there must be less "controlling" of supplies and more assistance in deliveries. One hopes that Col. Alexander's desire to get together not only all necessary supplies for manufacturers, but actually to set up a reserve stock, will be achieved ere long. It is, however, fairly certain that this happy issue can only be achieved by something very like wholesale slaughter among junior officials in the department which he has recently taken over.

### A CHANGE OF NAME.

It should be noted that the name of the B.D.V. Aircraft Spares is altered to P.D.V. Aircraft Co., Ltd., as from Jan. 13th and registered under the same with a capital of £10,000 in £1 shares.

The management of the company will be carried on as heretofore by Mr. H. Philippe De Vov, who will be assisted by Mr. Robert Lee and Mr. S. Marshall.

The conversion of the firm into a limited company has enabled it to place down a new plant of machinery, and the management are now in a position to manufacture all metal aircraft components.

### ECONOMISING TIMBER.

It is interesting to learn that the Air Board are circularising aircraft factories on the economical cutting up of timber, diagrams being given showing the correct way of sawing up planks of various grains. There are various opinions of the diagrams given, and they are generally considered to be very poor indeed. Furthermore, diagrams are not sufficient, and it is impossible to learn from them alone how economically to saw up, aeroplane timber. In the writer's opinion, the circular should be followed up with personal visits by men who have had years of practical experience in the cutting up of aircraft wood, to watch the operation carried out at the various works, and give practical and expert advice where necessary.

### THE MARTINSYDE MUSICAL SOCIETY.

Most aircraft firms of note now possess some organisation for providing recreation for the employees. In some cases this takes the form of an athletic association, embracing the various sports, while other co-operative efforts include an orchestra and musical and dramatic society.

The "Martinsyde Musical Society" has inaugurated a series of concerts, dances, and whist drives, which should be popular.

The society possesses a valuable secretary in Mr. Eric Lewis, who has very good histrionic powers, to which there was sufficient testimony at a concert held in the messroom on Jan. 22nd. The whole programme maintained an excellent level, reflecting favourably on the abilities of the various employees. The successful existence of a society of this kind is necessarily dependent on the assistance of all members, and it is the wish of Mr. Lewis that the forthcoming concerts should reach a very high level. It is hoped that any employees having experience of orchestral work will offer their services to the secretary.

### THE CONTROL OF TIN.

All supplies of tin have now come under the control of the Ministry of Munitions. On December 21st the Ministry issued a notice stating that Regulation 30a of the Defence of the Realm Act as now applicable to Tin; and on Dec. 27th further particulars were issued, as follows:—

(1) The Regulations do not apply to purchases made outside the United Kingdom until the metal reaches this country.

(2) Export orders and sales to Allied or neutral countries through authorised channels are deemed to be consumers' orders.

(3) It is permissible for merchants, warehousemen, and retailers to replace metals sold after Dec. 21st, 1917, by the purchase of an equivalent quantity of the same metal, but not more, although the metal so purchased may not be the metal actually delivered against the sale.

(4) Consumers may buy for their own consumption only.

The step taken by the Ministry has not come as a surprise; in fact, one is surprised that something of the kind was not done before. The particulars given above are similar to the order issued last year governing Copper transactions, and evidently signify that if the price does not shortly reach a reasonable figure, a stricter control will be exercised.

The first result of the regulations was to practically bring the market to a standstill, and although it is difficult to prophesy future results, there is good reason to expect a falling off in price. In fact, there has already been a fall of £13, and indications of the price becoming easier.



# SAFETY 'TRIPLEX'

## Safety Behind 'Triplex'

— THE ONLY UNSPLINTERABLE GLASS. —  
SUCCESSFULLY USED FOR GOGGLES,  
AEROPLANE AND AUTOMOBILE WINDSCREENS,  
WINDOWS, etc Catalogue Mailed on Request.

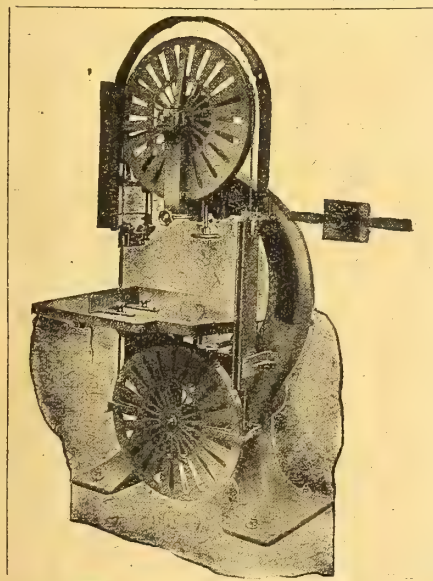
The 'Triplex' Safety Glass Co., Ltd.

REGINALD DELPECH (Managing Director),  
1, ALBEMARLE STREET, PICCADILLY, LONDON, W.1.  
CONTRACTORS TO H.M. GOVERNMENT.

# HAIGHS

(OLDHAM) LIMITED

MANUFACTURERS OF ALL TYPES OF WOOD WORKING MACHINERY.



## C.K.S. Type High Speed Band Sawing Machine

Built in Three Sizes with Saw Pulleys.

26 inches, 30 inches, and 36 inches diameter.

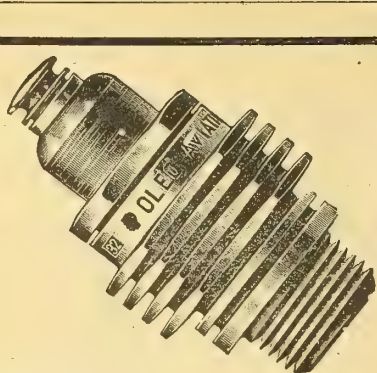
Globe Iron Works, Oldham.

*Early delivery can be given.*

Telegrams: HAIGH, OLDHAM.  
Telephone: 1273 Oldham.

*Haighs*  
(OLDHAM) LTD.

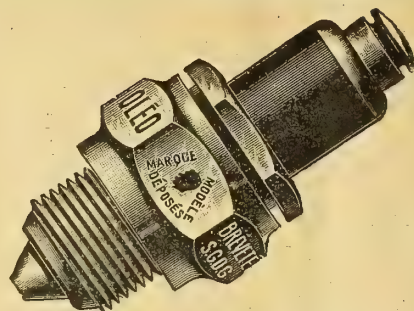




TYPE No. 32.



"The Smile of Success."



TYPE No. 27G.

OLEO were the first Aero Plugs ever made.  
 OLEO won the Aero Grand Prix SIX TIMES in succession.  
 OLEO Plugs have been supplied to the Government since 1913.  
 OLEO Aero Plugs have the "Largest Sale in the World."  
 OLEO Plugs have won over £30,000 in prizes.  
 OLEO Plugs were the first to Loop the Loop.  
 OLEO Plugs were the first to Cross the Alps.  
 OLEO Plugs are supplied to NINE Governments.



## Seaplanes and Land Machines.

Contractors to  
H.M. ADMIRALTY  
and  
\* WAR OFFICE.

The BLACKBURN  
AEROPLANE and  
MOTOR CO., Ltd.,  
LEEDS  
And at Hull.

*"Always at the Front."*

# Blackburn

## AIRCRAFT

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

Steele's Ad. Serv.



(Continued from page 474.)

WAR OFFICE, Jan. 28th.

REGULAR FORCES—ESTABLISHMENTS—R.F.C.—MIL. WING.  
—Flt. Comdrs.—From Flying Officers, and to be temp. Capts.  
whilst so empld.:—Temp. Sec. Lt. V. W. Burgess, Gen. List,  
Jan. 9th. Sec. Lt. M. R. Helliwell, Spec. Res., Jan. 12th.

Special Appt.—(Graded as a Flt. Comdr.)—Lt. E. G. N.  
Grimble, Herts. R., T.F., a Balloon Comdr. (graded as a bal-  
loon Officer), and to be temp. Capt. whilst so empld., Dec. 11th,  
1917.

Experimental Officer, 2nd Cl.—(Graded as an Equipt. Officer,  
2nd Cl.)—Lt. L. F. Peaty, Spec. Res., from an Equipt. Officer,  
2nd Cl., Jan. 3rd.

SCHOOLS OF INSTRN. ARMAMENT SCHOOL.—Instr. in Gunnery.—  
(Graded as an Equipt. Officer, 1st Cl.)—Temp. Lt. G. M. John-  
stone, Gen. List, from an Asst. Instr. in Gunnery (graded as  
an Equipt. Officer, 2nd Cl.), and to be temp. Capt. whilst so  
empld., Dec. 31st, 1917.

Gen. List.—Temp. Lts., Gen. List, to be temp. Capts. (with-  
out the pay or allowances of that rank) whilst specially empld.:  
G. M. Garro-Jones, C. M. Pletts, W. J. R. Sheppard, R. Fergu-  
son, Dec. 18th, 1917.

OVERSEAS CONTINGENTS.—CANADA.—CAN. ARMY PAY CORPS.—  
Temp. Capt. J. G. Garneau is secd. for duty with the R.F.C.,  
Dec. 22nd, 1917.

\* \* \*

The following are among the decorations and medals awarded  
by the Allied Powers at various dates to the British forces for  
distinguished services rendered during the course of the cam-  
paign. The King has given unrestricted permission in all  
cases to wear the decorations and medals in question:—

## CONFERRED BY THE KING OF SERBIA.

ORDER OF THE WHITE EAGLE.

4TH CLASS (WITH SWORDS).

Bt. Lt.-Col. (temp. Lt.-Col.) G. W. P. Dawes, D.S.O., R. Berks.  
R. and R.F.C.

4TH CLASS.

Capt. (temp. Maj.) A. Cleghorn, R.E. and R.F.C.

CORRIGENDUM.—Omitted from list published Feb. 24th,  
1917, of Names of Officers brought to the Notice of the Secre-  
tary of State for War for Valuable Services in connection with  
the war:—Capt. H. A. P. Disney, Cambs. Regt. and R.F.C.

## FROM THE COURT CIRCULAR.

YORK COTTAGE, SANDRINGHAM, Jan. 23rd.

The following Officer had the honour of being received by the  
King, when His Majesty invested him with the Insignia of the  
Divisions of the Orders into which he has been admitted:—

THE MOST DISTINGUISHED ORDER OF ST. MICHAEL AND ST.  
GEORGE AND THE DISTINGUISHED SERVICE ORDER.

COMPANION:—Capt. CHARLES LAMBE, R.N.

The King then conferred decorations as follows:—

## THE MILITARY CROSS.

Capt. DURHAM HALL, York R. and R.F.C.  
Lt. JAMES THOMPSON, Reserve of Officers, attd. R.F.C.  
Sec. Lt. SAMUEL JOLLEY, R.F.C.

## THE ALBERT MEDAL.

Flt. Serjt. HENRY HEARNE, R.F.C.

At about 3 p.m., a fire broke out inside a large bomb store  
belonging to the Royal Flying Corps, which contained nearly  
2,000 high-explosive bombs—some of which had very large  
charges—and a number of incendiary bombs which were  
burning freely. Lt.-Col. Cyril Louis Norton Newall at once  
took all necessary precautions and, assisted by 2nd Cl. Air  
Mech. (now Cpl.) Alfred Edward Simms, poured water into  
the shed through a hole made by the flames. He sent for  
the key of the store, and with Cpl. (now Flt. Serjt.) Henry  
Hearne, 1st Cl. Air Mech. (now Sec. Lt.) Harrie Stephen  
Harwood and Simms (to all of whom Medals have been  
awarded) entered the building and succeeded in putting out  
the flames. The wooden cases containing the bombs were  
burnt, and some of them charred to a cinder.

Serjt. WILLIAM RHOADES, R.F.C.

At an aerodrome in France a bomb accidentally exploded in  
the mouth of a dug-out forming a bomb store, which con-  
tained a large number of bombs packed in wooden cases and  
a quantity of rockets. Two men were killed by the explo-  
sion, and another man, who was severely injured, was thrown  
down into the store. Dense volumes of smoke issued from  
the dug-out, and there was great risk of a further explosion.  
On hearing a call for help, an officer, accompanied by Serjt.  
Rhoades, immediately entered the dug-out, and they succeeded  
in rescuing the injured man, who would otherwise have been  
suffocated.

## NAVAL.

The following appointments have been made in the Royal Naval  
Air Service:—

JAN. 22nd.—Capt. R.M.A. (Temp.).—J. H. D'Albiac, D.S.O.,  
entered as Prob. Flt. Comdr. (temp.), seny. Dec. 31st.

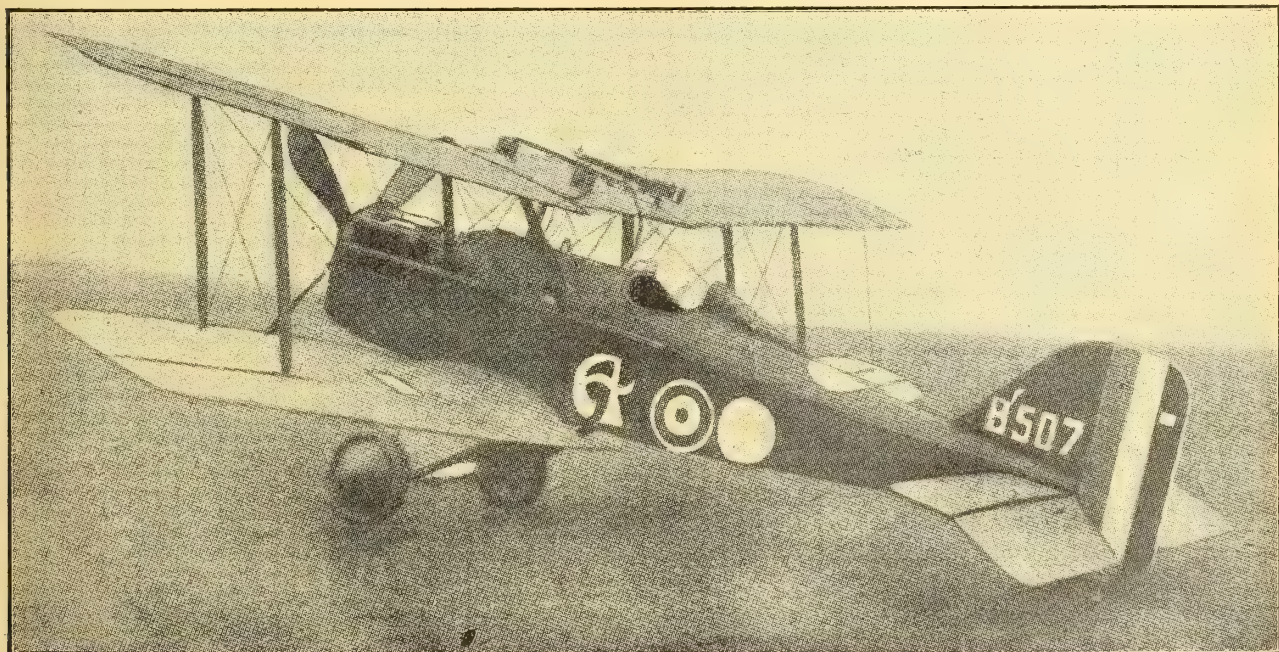
Warrt. Officers, 2nd Gr.—(Temp.).—W. A. Kingston and  
W. J. Standish, both granted temp. commns. as Lt. (R.N.V.R.),  
seny. respectively Jan. 4th and 8th.

Temp. commns. as Lt. (R.N.V.R.) have been granted to the  
following, seny. as stated:—A. D. S. Rice, Dec. 29th; J. W. V.  
Paul, Jan. 2nd; H. Jeffreys and A. C. Osborne, Jan. 20th.

JAN. 23rd.—Temp. commns. (R.N.V.R.) have been granted to  
the following:—Lts.—W. C. Short, B. Collbran, C. R. Lodge,  
and C. S. Johnston.

JAN. 24th.—Flt. Comdr.—H. Stewart, promoted to rank  
of Sqdn. Comdr., seny. Dec. 31st.

Sub-Lt. (Temp., R.N.V.R.).—L. Taverner, promoted to Lt.  
(Temp., R.N.V.R.), seny. Jan. 1st.



IN THE HANDS OF THE ENEMY.—Three-quarter rear view of an S.E.5.



Temp. commns. (R.N.V.R.) have been granted, seny. as stated:—Lts.—A. E. Harford, Jan. 27th; and L. E. Anstey-Bennett, Jan. 28th.

JAN. 26th.—Lt. (Temp. R.N.V.R.).—F. E. Rogers, entered as Flt. Lt., seny., Jan. 23rd.

Wt. Officer, II.—F. H. E. Nash, granted a temp. commn. as Lt. (R.N.V.R.), seny., Jan. 25th.

JAN. 28th.—Flt. Sub-Lt. (Temp.).—J. K. Fryer-Smith, promoted to rank of Flt. Lt. (temp.), seny. Dec. 31st.

#### ADMIRALTY COMMUNIQUE'S.

JAN. 22nd.—The following is from a more detailed report of the events in connection with the sortie of the "Goeben" ("Sultan Selim") and "Breslau" ("Midilli") from the Dardanelles on Jan. 20th:—

At 5.20 a.m., when H.M. destroyer "Lizard" was about two miles from the north-easterly point of Imbros on patrol duty, she sighted "Breslau" steaming in a northerly direction to the south-east of Cape Kephala, shortly followed by "Goeben" about a mile astern.

"Goeben" continued on her southerly course until an attack by our aircraft forced her to alter course and head for the Dardanelles.

Our aircraft repeatedly attacked her, and obtained two direct hits when off Chanak. "Goeben" was now in such a damaged condition that she was steered for the shore, and was beached at the extreme end of Nagara Point, about 100 yards from the lighthouse.

Shortly after beaching two more direct hits were made on her by our aircraft, who were heavily engaged by several enemy seaplanes.

In the encounters which took place one of our seaplanes failed to return.

Our aircraft reported on Monday afternoon that "Goeben" was still ashore in the same position. She is still being bombed.

JAN. 23rd.—In continuation of the former communiqués, R.N.A.S. machines have made several day and night attacks on the "Goeben" and have secured two hits with heavy bombs; they have also bombed one of the tugs which was secured alongside the "Goeben."

In every case heavy anti-aircraft gunfire was encountered, but all our machines have returned safely.

These attacks are continuing.

JAN. 25th.—During Jan. 25th a bombing raid was carried out by naval aircraft on the enemy's aerodrome at Varsenaere.

Direct hits were made. All our machines returned safely.

On the 23rd inst. in the course of a sighter patrol two enemy aircraft were destroyed.

One of our machines is missing.

DARDANELLES.—Since the last communiqué, attacks on the "Goeben" have been carried on ceaselessly both by the Royal Naval Air Service and the Royal Flying Corps, and during the last 48 hours some seven tons of bombs were dropped on and round the ship, and on the aerodrome at Galata, several direct hits being observed, and results have been confirmed by photographic reconnaissances.

The Turkish cruiser which was near the "Goeben" has left, and proceeded up the Straits, and a steamer which was apparently engaged in lightening the "Goeben" was forced to desist.

The anti-aircraft fire has been very severe, but the only casualty as yet reported is one Greek officer, whose machine was shot down.

The operation is continuing.

JAN. 28th.—At noon, on Jan. 27th, naval aircraft carried out bombing raids on Aertrycke aerodrome and Engel dump. Both targets were partly obscured by clouds, which rendered observation of exact results difficult.

All our machines returned safely.

DARDANELLES.—Bad weather has hampered aerial operations against the "Goeben." Nevertheless, several raids have been carried out and some bombs have been dropped on her, and on gun positions at Gaba Tepe.

At noon on the 27th the position of the ship was unchanged.

[See the Turkish Communiqué.—Apparently the "Goeben" has got away. One single torpedo-carrying seaplane would have abolished the "Goeben" for ever.—Ed.]

#### THE CASUALTY LIST.

Reported Jan. 26th.

ACCIDENTALLY KILLED.—Burden, Flt. Lt. C. E., R.N.

Floyd, Prob. Flt. Officer W. F., R.N.

Coo, Prob. Flt. Officer H. T., R.N.

Langstone, Prob. Flt. Officer H. C., R.N.

Huddleston, Prob. Flt. Officer L. G., R.N.

DIED OF INJURIES.—Murray, Actg. Flt. Comdr. C., R.N.

MISSING (FEARED KILLED).—Johnston, Flt. Sub-Lt. W., R.N.

WOUNDED.—Beveridge, Flt. Sub-Lt. J. E., R.N.

ACCIDENTALLY INJURED.—Cameron, Flt. Sub-Lt. A. A., R.N.

Bricker, Prob. Flt. Officer H., R.N.

Chesterton, Prob. Flt. Officer E. C., R.N.

#### PERSONAL NOTICES.

##### DEATHS.

BURDEN.—Apparently through engine trouble, when flying low, an aeroplane fell to earth in Thanet on Jan. 22nd, the pilot, Flt. Lt. Burden, R.N., being killed.

FLOYD.—Prob. Flt. Officer William Eric Floyd, R.N., who was killed whilst flying on Jan. 21st, was the eldest son of Dr. W. R. and Mrs. Floyd of Devonshire Road, Cloughton, Birkhead. He was 19 years of age.

HUDDLESTON.—Prob. Flt. Officer L. G. Huddleston, R.N., who was killed whilst flying in Lincolnshire on Jan. 22nd, was the eldest son of Mr. and Mrs. J. Snow Huddleston, of Blackheath. He was eighteen years of age.

SCOTT.—Lt. James Garnet Scott, R.N.V.R., att'd. R.N.A.S., who died suddenly on Jan. 25th, while serving at a Royal Naval Depot, was only son of the late W. M. Scott, M.D., and of Mrs. Scott, of Queen's Gate Gardens, and grandson of the late W. Chaplin, of St. Catharines, Ontario. He was appointed Sub-Lt. R.N.V.R. in June, 1916.

##### BIRTH.

McHARDY.—On Sunday, Jan. 20th, at The Red House, Lamorbey, Sidcup, the wife of Flt. Lt. Graham G. McHardy, R.N., of a son.

If any prisoner of war returning from Germany can give any information of Flt. Comdr. H. A. Busk, R.N., will he please communicate with Mrs. Busk, of 6, Wadham Gardens, N.W.3?

\* \* \*

If any officer or man recently returned from any German camp or hospital can give information regarding Flt. Comdr. B. D. Kilner, R.N.A.S., aged-22, who was reported missing on Sept. 25th, 1917, it will be most gratefully received by his mother, Mrs. Kilner, 2, Langham Mansions, Earl's Court Square, London.

#### MILITARY.

##### G.H.Q. COMMUNIQUE'S.

JAN. 22nd, 9.25 p.m.—On the 21st, flying was confined to observation for the military and the dropping of bombs in the enemy forward areas, owing to frequent rainstorms.

After dark, when the weather cleared, our night-flying machines were very active. They dropped over 200 bombs on aerodromes in the neighbourhood of Courtrai and on the enemy's billets at Roulers and Rumbeke, south-east of Roulers.

Raids were also carried out into Germany, two tons of bombs being dropped on the steel works at Thionville, on the large railway sidings at Bernsdorf (30 miles south-east of Metz), and on Arnville railway junction, just south of Metz.

One machine is unaccounted for.

JAN. 23rd, 9.33 p.m.—On the 22nd inst. there was a great improvement in the weather, visibility being excellent after the rain.

A great many hostile batteries were engaged by our artillery with aeroplane observation, and numerous photographs were taken.

Nearly 400 bombs were dropped by us on the enemy's billets at Roulers and Menin, on a large ammunition dump near Courtrai, and on other targets in the enemy's forward areas.

Several thousand rounds also were fired from our aeroplanes at different ground targets, including hostile troops and transport on roads and active hostile batteries and machine-guns.

Seven of the enemy's machines were brought down in air fighting, and two others were driven down out of control. A hostile observation balloon was brought down in flames.

Two of our machines are missing.

JAN. 24th, 9.10 p.m.—Owing to rain, little flying was possible on the 23rd inst.

During the night of the 23rd-24th hostile aerodromes in the neighbourhood of Courtrai were again bombed by our machines, as well as an aerodrome north of Ghent used by the enemy's night-flying aeroplanes. Hostile billets round Roulers were also attacked by us with bombs and machine-gun fire.

All our aeroplanes returned.

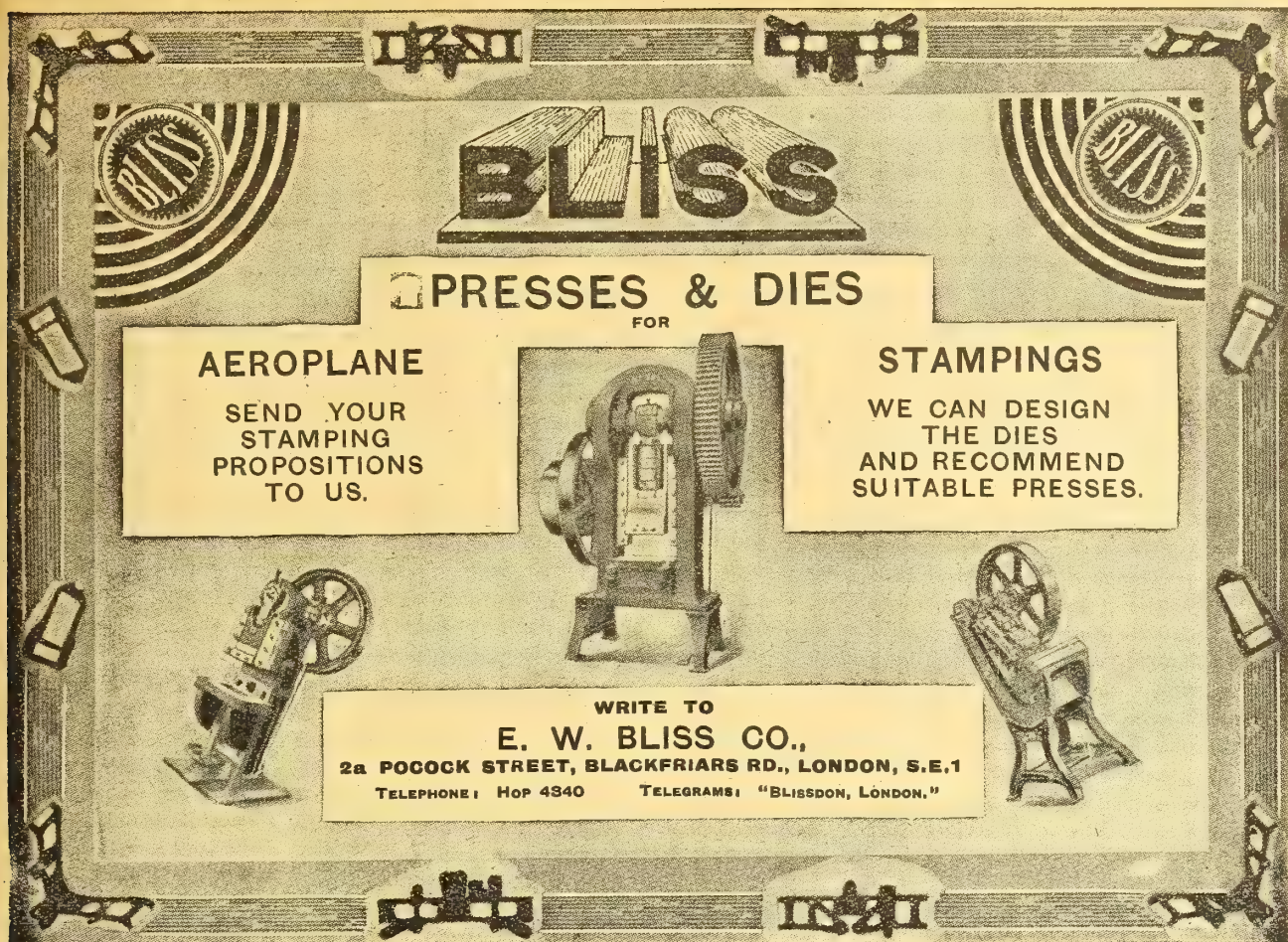
JAN. 25th, 10.12 p.m.—On the 24th instant there was great aerial activity on the northern portion of the front, where the weather was good.

Hostile batteries were engaged throughout the day by our artillery, with aeroplane observation, and photographs were taken.

Over 300 bombs were dropped on Courtrai, Ledeghem, and Douai railway stations, on a hostile aerodrome near Courtrai, and on the enemy's billets west of Cambrai.

One of our pilots fired into the hangars on the enemy's aero-





**BLISS**

**PRESSES & DIES**  
FOR

**AEROPLANE**  
SEND YOUR  
STAMPING  
PROPOSITIONS  
TO US.

**STAMPINGS**  
WE CAN DESIGN  
THE DIES  
AND RECOMMEND  
SUITABLE PRESSES.

WRITE TO  
**E. W. BLISS CO.,**  
2a POCKOCK STREET, BLACKFRIARS RD., LONDON, S.E.1  
TELEPHONE: HOP 4340 TELEGRAMS: "BLISSDON, LONDON."

**WE CAN DELIVER**

**A.G.S. Shackles 158**

Sizes A and B ————— In any

**QUANTITIES AT ONCE**

:: :: The ACTUAL Manufacturers :: ::

**The British Gold Shell Ring Co. Ltd.**

**HOUNSLOW, MIDDLESEX.**

— Telegraphic Address —  
"GOLSHEL, HOUNSLOW."

— Telephone —  
HOUNSLOW 254

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



drome at Douai with his machine-gun, and other ground targets were repeatedly attacked in this way.

In air fighting seven hostile machines were brought down and five others were driven down out of control. Two of our machines are missing, including one which was seen to collide with a German machine during combat.

As soon as it was dark our night-flying squadrons bombed a German aerodrome north-east of Ghent, as well as other aerodromes near Courtrai and hostile billets round Roulers.

In spite of a thick ground mist, which rose after our machines had left their aerodromes, all returned safely.

At the same time other night-flying machines carried out most successful raids on several objectives in Germany.

Bombs were dropped on the factories at Mannheim, on the Rhine, where direct hits were obtained on a large factory, and also on the docks and on the town.

The barracks and railway station at Trèves, the steel works at Thionville, and the railway stations at Saarbrücken and Oberbiling (south-west of Trèves) were also attacked with excellent results.

Our pilots report large explosions on all objectives, and that a large fire was caused at Trèves.

One of our machines failed to return.

JAN. 26th, 9.15 p.m.—After the thick morning mist on the 25th inst. had cleared there was again great activity in the air. Work with the artillery was continued by our aeroplanes, and a large number of photographs were taken of the enemy's back and forward areas.

The large railway sidings at Courtrai and the enemy's billets at Roulers were bombed, as well as other targets.

Hard fighting took place all along the line, the results being greatly in our favour. Ten hostile aeroplanes were brought down and six others driven down out of control.

One of our machines is missing.

On the night of the 25th-26th inst. our night-flying squadrons were active as soon as it was dark, their activity continuing until about 3 a.m., when a very heavy mist set in and rendered flying impossible.

During the fine period of the night over eight tons of bombs were dropped by us, several pilots doing two trips. Five of the enemy's large aerodromes in the neighbourhood of Ghent were bombed, and also billets in the vicinity of Douai. Over 160 bombs were dropped on a new hostile aerodrome west of Tournai.

All of our machines returned.

JAN. 27th, 9.2 p.m.—On the 26th inst. there was very little activity in the air owing to the dense mist.

One hostile aeroplane was shot down by anti-aircraft gunfire.

At about midday on the 27th inst. the railway station and communications at Trèves were successfully bombed by our machines. A heavy mist hung over the objective, and prevented our pilots from observing the exact location of the bursts.

All our machines returned safely.

#### WAR OFFICE COMMUNIQUÉS.

JAN. 23rd.—The G.O.C. the British Forces in Italy reports:—Aircraft activity has been rather hampered by weather and very little flying has been possible. The usual patrol activity continues.

JAN. 24th.—The G.O.C. the British Forces in Mesopotamia reports:—

On January 21st a successful bombing raid was carried out on a Turkish aerodrome at Kifri (about 100 miles N.E. of Bagdad, on the main road to Mosul). One of our machines was brought down by the enemy's anti-aircraft guns. On the same day a hostile aeroplane was forced to land within our lines near Falluja (?Feluja, on the Euphrates, 35 miles east of Bagdad) and was destroyed.

JAN. 27th.—The G.O.C. the British Forces in Palestine reports:—

During the past few days the activity of our air services has been maintained. On Jan. 22nd the enemy camps and depôts on the railway west of Sebastieh (Samaria) were again raided, half a ton of bombs being dropped and several direct hits observed.

On Jan. 24th two enemy aeroplanes were wrecked in aerial combats.

On Jan. 25th our bombing squadrons surprised a formed body of some 2,000 enemy troops in close formation near Hawara (on the Jerusalem-Nablus road, 4½ miles south of Nablus, Shechem). Half a ton of bombs were dropped on the hostile column before it could disperse. At the same time a camp of mounted troops was bombed and the animals were stampeded.

JAN. 28th.—The G.O.C. the British Forces in Italy reports:—

Our aircraft have been active in aerial combats and reconnaissance work. Six enemy machines and two balloons have been shot down during the past week.

The total number of hostile aircraft destroyed since the end of November, when our machines commenced operations, is 37 enemy machines shot down, two driven down out of control, and four balloons burnt, while only five of our machines are missing.

#### HOME COMMAND COMMUNIQUÉS.

JAN. 28th, 11.15 p.m.—Hostile aeroplanes crossed the Kent and Essex coasts shortly before 8 p.m., and proceeded towards London.

Some machines penetrated to the capital, where bombs were dropped between 9 and 10 p.m.

Latest reports show that one enemy machine was brought down by our airmen in Essex.

JAN. 29th, 12.45 a.m.—A further attack was delivered on London after midnight, bombs being dropped about 12.30.

The raid is still in progress.

JAN. 29th, 11.30 a.m.—Latest information shows that two groups of raiders crossed the Essex Coast and one group the Kent Coast practically simultaneously about 8 p.m.

The two former detachments proceeded towards London on parallel courses across Essex. The capital was approached from the east and north-east shortly after 9 p.m.

Of the machines which crossed the Kent Coast, two dropped bombs in the Isles of Thanet and Sheppey. The remainder, crossing the Thames Estuary, also approached East London through Essex.

Apparently about fifteen machines took part in these attacks, of which four or five reached the capital and dropped bombs in various districts between 9 and 10 p.m.

Some time after the first attack had terminated other enemy aeroplanes crossed the Essex Coast. Only one of these reached London, which was entered from the north, bombs being dropped between 12.15 and 12.30 a.m.

A number of machines of the Royal Flying Corps went up.

Two of our scouts encountered an enemy aeroplane over Essex. After a brief fight at close range the raider took fire and fell in flames to the ground ten thousand feet below.

All three members of its crew were burnt to death.

Several other engagements with enemy machines are reported by our pilots, one of whom pursued a raider across the coast and fought an indecisive engagement over the sea.

All our pilots returned safely.

Reports of casualties will be published when complete lists have been received.

[On Tuesday afternoon in the House of Commons Mr. Macpherson stated that 47 persons had been killed and 169 injured, of whom 14 men were killed and 93 injured; 17 women were killed and 59 injured; and 16 children were killed and 17 injured.]

#### THE CASUALTY LIST.

Reported Jan. 23rd.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Fleming, Capt. W. A., M.C., Devon. R., attd. R.F.C.  
Hinkley, Sec. Lt. D. R., Y. and L. R., attd. R.F.C.  
MISSING.—Urwin, Sec. Lt. T. A., R.F.C.

PREVIOUSLY REPORTED PRISONER, NOW REPORTED WOUNDED AND PRISONER IN GERMAN HANDS.—Smith, Sec. Lt. E. A. L. F., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN GERMAN HANDS.—Cobbold, Lt. F.R.C., R.F.C.  
Frith, Sec. Lt. R.G., R.F.C.  
Kendall, Sec. Lt. S., R.F.C.  
Leach, Lt. J. M., Yorks. R., attd. R.F.C.  
Meggitt, Lt. W. G., M.C., Welsh R., attd. R.F.C.  
Robinson, Sec. Lt. H. G., R.F.C.

Reported Jan. 24th.

KILLED.—Balfour, Sec. Lt. A. S., R.F.A., attd. R.F.C.  
WOUNDED.—Chappell, Capt. R. W., R.F.C.  
Hall, Sec. Lt. F. H., R.F.C.  
Hoyland, Sec. Lt. L. B., R.F.C.  
McPherson, Sec. Lt. R., R.F.C.

MISSING.—Biddington, Sec. Lt. H. V., R.F.C.  
Boyd, Lt. J., Sco. Rif., attd. R.F.C.  
Corbet, Sec. Lt. J. H., Shrops. L.I., attd. R.F.C.  
Davies, Sec. Lt. H. E., R.F.C.  
Young, Sec. Lt. J. H., Lond. R., attd. R.F.C.

Reported Jan. 25th.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Kember, Sec. Lt. W., Lan. Fus., attd. R.F.C.  
WOUNDED.—Cross, Sec. Lt. J. E., Manch. F., attd. R.F.C.  
Haggas, Lt. W. R., L.N. Lan. Regt., attd. P.F.C.  
Hartley, Sec. Lt. J. H., R.F.C.  
Haughan, Sec. Lt. J. H., R.F.C.  
Nichols, Lt. B. G., R.F.A., attd. R.F.C.

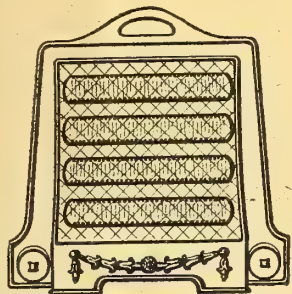
Reported Jan. 26th.

MISSING.—Tracey, Sec. Lt. H. A., S. Wales Bord., attd. R.F.C.  
PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN GERMAN HANDS.—Brown, Sec. Lt. C. H., R.F.C.  
Miller, Sec. Lt. D., R.F.C.  
Ogden, Sec. Lt. C. E., R.F.C.  
Yeo, Sec. Lt. H. A., R.F.C.



# BELLING ELECTRICAL ACCESSORIES

FOR  
**AIRCRAFT**  
Manufacturing  
Purposes.



## ELECTRIC FIRE.

OFFICE PATTERN. List No. 617.

An ideal fire for small offices, waiting-rooms, passages, etc. We have also supplied a large number to Aerodromes for general heating. Numerous other designs are available.

PRICE 35/-

Dimensions—Height 17½ in., Width 17½ in., Depth 5½ in.



## ELECTRIC

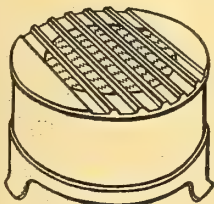
### AIR WARMER.

List No. 960.

A reliable low temperature heating appliance, suitable for work rooms, etc. Can be used in any position without risk of fire.

PRICE 25/-

Dimensions—Length 15½ in., Width 6½ in., height 4½ in.



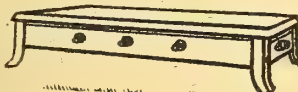
## ELECTRIC

### BOILING RING. List No. 7.

This will do all the same operations as an ordinary gas ring. Used for heating glue pots, and when loaded at 250 watts can be attached to any electric lampholder.

PRICE 15/-

Diameter 7 in.



## ELECTRIC

### HOT PLATE. List No. 18.

Useful for keeping food warm, and also for drying purposes of all kinds.

PRICE 100/-

Size 36 in. by 18 in.



## ELECTRIC

### IMMERSION HEATER.

A reliable appliance for heating water, oil and other liquids. Can be easily fitted to existing tanks, etc.



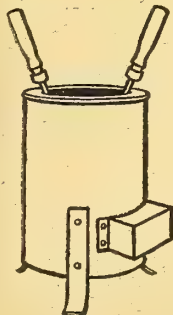
## ELECTRIC

### ENGINE WARMER.

For placing under engine in cold weather to prevent freezing. They are quite gas and fireproof.

PRICE 40/-

Size 12 in. by 7 in.



## ELECTRIC

### SOLDER POT. Type A.

This is the latest system for heating ordinary soldering irons, and consists of a pot of molten solder into which the irons are placed for a short time till heated.

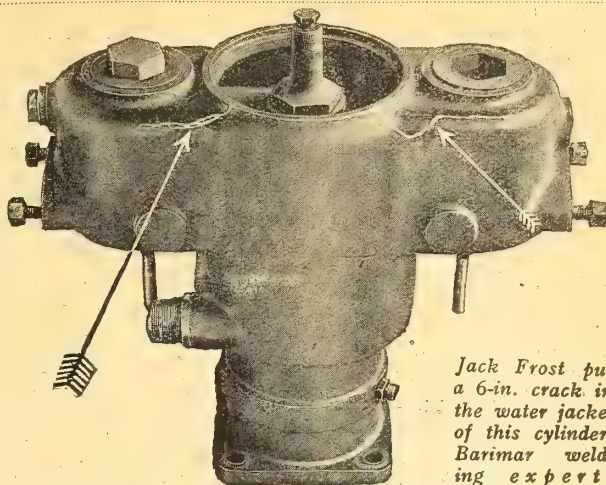
PRICE 65/-

Dimensions—Outside diam. 8 in., inner pan 5½ in. diam. at top, Depth 7 in.

All the above prices are subject to an advance of 25 per cent.

Our Catalogue illustrates many other special appliances we make for Manufacturing Purposes, Munition and Factory Work, Hospitals, Mess Rooms, etc.

**BELLING & CO.,** MANUFACTURING  
ELEC. ENGRS.,  
DERBY RD. WORKS, MONTAGUE RD., EDMONTON, LONDON, N. 18.



Jack Frost put a 6-in. crack in the water jacket of this cylinder. Barimar welding experts

tackled the job, and made an efficient repair in slightly under 26 hours. A typical example of Barimar speed and efficiency.

## Has Jack Frost cracked your cylinders?

A sudden nip of frost overnight brings sorrow to many car owners in the morning.

As all cars in use are now engaged on National Service, a hold-up through frost-cracked cylinders is a serious matter.

Put your faith in Barimar, for a special department has been arranged to deal with "hurry" work in welding cylinders cracked by frost or broken through other causes.

Radiators that caught the frost-nip are also repaired quickly.

Do not hesitate to put your repairs on rail at once. Barimar charges are always reasonable, and the work is done under the Barimar famous "Money-back" Guarantee.

By the way, it is always safe to send your aluminium parts to Barimar for welding, because we know how to handle this metal and can guarantee our work.

## Write for Free Booklet

Just a little thing telling about the work of our factory. Title, "How Barimar Performs Miracles," written by a journalist. Ask for booklets and mention THE AEROPLANE.

## HOW TO SEND URGENT REPAIRS

Remove all fittings, attach label bearing your name and address. If the job weighs less than one cwt., rush it to the passenger train. That will save time. If sent by goods rail kindly pay carriage. Send us full instructions by post in either case.

Address repairs to Dept. B.C.

**BARIMAR**  
LIMITED,

10, Poland Street,  
Oxford Street, London, W.1.

Wire us—  
Bariquamar, Reg., London.

'Phone us—  
Gerrard 8173

Do it to-day.

KINDLY MENTION "THE AEROPLANE"

WHEN CORRESPONDING WITH ADVERTISERS.



PREVIOUSLY REPORTED PRISONERS, NOW REPORTED WOUNDED AND PRISONERS IN GERMAN HANDS.—Braithwaite, Sec. Lt. B. F., R.F.C.

Cartledge, Sec. Lt. R. A., R.F.C.

Reported Jan. 28th.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Batson, Sec. Lt. H. T., R.W. Surr. Regt., attd. R.F.C.

Pickstone, Sec. Lt. C., R.F.C.

WOUNDED.—Roy, Sec. Lt. I. L., R.F.C.

MISSING.—Goldie, Lt. G. N., R.F.C.

Vills, Lt. A. S., Yeo., attd. R.F.C.

Ross, Sec. Lt. D. W., R.F.C.

Taylor, Sec. Lt. W., E. Lan. R., attd. R.F.C.

PREVIOUSLY REPORTED PRISONER, NOW REPORTED DIED OF WOUNDS AS PRISONER IN GERMAN HANDS.—Morgan, Sec. Lt. W. G., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN GERMAN HANDS.—Kidd, Sec. Lt. A. L., R.F.C.

Palmer, Sec. Lt. A. W., R.F.C.

Reported Jan. 29th.

MISSING.—Barnes, Lt. J. D., Durh. L.I., attd. R.F.C.

#### CASUALTIES AMONG N.C.Os. AND MEN.

THE DATES ARE THOSE OF THE OFFICIAL LIST.

PREVIOUSLY MISSING, NOW REPORTED KILLED.

JAN. 16th.—R.F.C.—Wickham 27234 Actg. Serjt. W. S. (Norwich) DIED.

JAN. 14th.—R.F.C.—Billingham 7987 1st Cl. Air Mech. J. A. (Wolverton).

JAN. 16th.—Hodgson 97229 Air Mech. T. A. (Acomb).

JAN. 17th.—Barnes 79074 1st Cl. Air Mech. J. (Burnley); Watford 79541 2nd Cl. Air Mech. H. J. (Basingstoke).

#### WOUNDED.

JAN. 17th.—R.F.C.—Crowther 50153 1st Cl. Air Mech. J. (Morley, Enlt.); King 53010 2nd Cl. Air Mech. W. C. (Framlingham); McKay 102855 2nd Cl. Air Mech. J. E. (Tooley Street, S.E.); Thomas 66249 2nd Cl. Air Mech. H. J. (Cowbridge).

PREVIOUSLY MISSING, NOW REPORTED BY THE GERMAN GOVERNMENT KILLED OR DIED OF WOUNDS.

JAN. 17th.—M.G.C., attd. R.F.C.—Cooper 31589 Cpl. A. J. (Aston).

#### PRISONER OF WAR IN GERMAN HANDS.

JAN. 15th.—R.F.C.—Conlin 7281 2nd Cl. Air Mech. P. (Barrow-in-Furness).

#### PERSONAL NOTICES.

##### DEATHS.

BRENDEL.—Whilst flying over the Mersey on Jan. 28th, Lt. Brendel, R.F.C., of London, fell into the water and was killed.

FENN-SMITH.—Sec. Lt. Warren Fenn-Smith, R.F.C., who was killed in aerial action in France on Jan. 18th was the younger son of the late William Fenn-Smith, of Port Elizabeth, South Africa, and Mrs. Louise Fenn-Smith, of The Beehive, Wembley Park, and of Ellis and Smith, Grafton Street, W. He was 18 years of age.

FORD.—Major R. N. Ford, M.C., acting commander of a battalion Royal Fusiliers (captain, Royal Fusiliers), was accidentally killed on Jan. 6th, while attending a flying course. He was the youngest son of Mr. and Mrs. E. S. Ford, of 17, Hyde Park Square, W., and Pengreep, Perranwell, Cornwall, and was educated at Temple Grove, Rugby, and Sandhurst. He entered the Army in 1903, and was gazetted captain in 1912. He was twice wounded in the second battle of Ypres, and received the Military Cross in January, 1917. His age was 33.

FREEMAN.—Lt. Henry Percival Freeman, Canadian Forces, who was accidentally killed on Jan. 21st whilst flying in England, was the son of Mr. and Mrs. Edmund Freeman, of Willesden Lane, N.W. He was 28 years of age.

HEASMAN.—Lt. George Harry, Cavalry, attd. R.F.C., who was killed whilst flying in England, was the eldest son of Mr. and Mrs. H. Heasman, East Grinstead.

HOLLAND.—Capt. Charles Holland, R.F.C., M.C., who was accidentally killed in Lincolnshire on Jan. 25th, was the third son of Mr. and Mrs. Holland, of Dunedin, Horsham.

NELSON.—Sec. Lt. Harold Griffith Nelson, R.F.C., was killed by falling from his machine at a height of 3,000 ft. while flying near Rugby on Jan. 22nd. He was alone, and it is supposed that in some inexplicable way the belt attaching him to the machine became unfastened. The aeroplane continued its flight and came down a few fields away.

SHARPLES.—Capt. Evelyn Horace Guy Sharples, R.F.C., whose death was announced last week, was 19 years of age. He was the only surviving son of the Rev. H. M. and Mrs. Sharples, of Finghall Rectory, Yorkshire. He was educated at Giggleswick and Haileybury, receiving a commission in the R.F.C. direct from college in Sept., 1916. He served seven months in France with distinction, being promoted flight-commander last August. He received an appointment at home last October.

TAYLOR.—Sec. Lt. Arthur Rowland Taylor, R.F.C., was accidentally killed while flying in Hampshire on Jan. 19th. He was the second son of Mr. R. C. Taylor and Mrs. Taylor, of Millwood House, South Brent, Devon, and late of Westfield, Berkhamsted. He was educated at Berkhamsted School, and went to America in March, 1913. He joined the Canadian R.F.C. in June, 1917, gained his wings, and came to England to finish his training last November.

WARD.—Sec. Lt. Andrew Rushworth Ward, R.F.C., the only surviving son of Mr. and Mrs. Horace R. Ward, of Rosedale, Pertherton Road, Highbury, N., born April 16th, 1898, was accidentally killed while flying on January 21st in Lincolnshire, during the final stage of his training. He was at Highbury Park School until the end of 1911, and at Merchant Taylors' School until the end of 1914, being a member of the O.T.C. for over two years. He was in camp at Rugeley, Stafford, at the outbreak of the war. On attaining the age of 18 he joined the Queen's Westminster Rifles, and obtained his commission in the R.F.C. on August 16th last.

#### ENGAGEMENTS.

CHAMIER—LORDLY.—The engagement is announced of Lt.-Col. J. A. Chamier, D.S.O., Indian Infantry and R.F.C., son of Maj.-Gen. F. E. A. Chamier, C.B., C.I.E., and of Mrs. Chamier, 55, Warwick Road, S.W.5; to Edwina Ratcliffe, only daughter of Mr. and Mrs. Lordly, Chester, Nova Scotia.

KAVANAGH—MARTIN.—The marriage arranged between Capt. Henry R. Kavanagh, Royal Irish Fusiliers and R.F.C., and Sylvia, younger daughter of Mr. and Mrs. James Martin, will take place at Long Ditton parish church (station, Sutton), on Saturday, Feb. 2nd, at 2 p.m. Invitations are not issued, but all friends will be welcome at the church.

LIVINGSTONE—COOPER.—A marriage has been arranged, and will shortly take place, between Capt. Alexander F. Livingstone, R.F.C., eldest son of the late Frederick Livingstone and Mrs. Livingstone, 33, Queensborough Terrace, Hyde Park, and Jeanette Margaret Graham, younger daughter of Alexander H. Cooper, W.S., 54, Manor Place, Edinburgh, and Glenturret, Crieff, Perthshire.

#### MARRIAGES.

DUNLOP—GRANDIN.—On Dec. 15th, at L'Eglise Notre Dame d'Auteuil, Paris, Lt. A. C. Dunlop, Kent Royal Engineers and R.F.C., third son of the late James Dunlop, Esq., of Anne-mount Ready, Armagh, Ireland, was married to Geogette Louise Grandin, younger daughter of the late Monsieur J. L. Grandin and Madame Grandin, of Paris.

HARPER—HAYNES.—On Jan. 26th, at St. Peter's, Eaton Square, London, Lt. William Eardley Harper, M.C., R.F.C., a son of Canon and Mrs. Harper, Dunimarle, Culross, was married to Muriel, daughter of Mr. and Mrs. Frederick Haynes, Hill morton Road, Rugby.



(Reproduced from "Flugsport.")

Three-quarter front view of the S.E.5 Biplane.



## WANTED TO PURCHASE

In an open Suburb around London, Small Works. Not less than 10,000 square feet floor space with additional land available for extension if required. Good natural light essential, also electric power. Close to Railway Station on main line and main road. Existing plant would be considered. Northern district preferred.

Particulars in first instance to:

C. D. CLAYTON, LTD., 52, Shaftesbury Avenue, W.1.

WE ARE PRODUCING DAY AND NIGHT

# A.G.S. PARTS,

and can accept immediate orders for:—

### HEX. NUTS.

A.G.S. Nos.  
115 B 2 BA. 238 B 2 BA.  
115 C 4 BA. 238 C 4 BA.  
115 D 6 BA. 238 D 6 BA.  
116 A  $\frac{1}{2}$  BSF.

### PINS.

(100 ton).  
A.G.S. No. 383.  
In all sizes from  
part No. 1 to 208.

### UNIVERSAL FORK JOINTS.

A.G.S. Nos. 333,  
334, 335, 336.

### TRUNNIONS and LOCK NUTS.

A.G.S. Nos. 333, 334,  
335, 336, 337, 338, 339,  
340 and 341.

HEX. BOLTS.—A.G.S. Nos.—101 68 BA, 102 4 BA, 103 2 BA, 105  $\frac{1}{2}$  BSF, 106 9/32 BSF,  
107 5/16 BSF. In various sizes.

# MEERLOO ENGINEERING COMPANY, LTD.

CONTRACTORS TO THE AIR BOARD.

EASTERN WORKS, Forest Lane, STRATFORD, LONDON, E.15.

THE MOST MODERN PLANT IN LONDON.

JOHN MEERLOO, Junr.  
Managing Director.

Telephone:  
Stratford 973.

Telegrams:  
"Aeromeccol, Phone, London."

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



**JENSEN—PALMER.**—On Jan. 17th, at St. James's Church, Bushey, Capt. J. Jensen, R.F.C., was married to Gwynfrid B. Palmer.

**MILES—TINDALE.**—On Jan. 21st, at Christ Church, Erith, Lt. John Lambert, R.F.C., younger son of Mr. and Mrs. J. M. Miles, of Forest Gate, Essex, was married to Margaret Stenhouse, eldest daughter of Mr. and Mrs. J. S. Tindale, of Gotherst, Erith, Kent, by the Rev. A. W. Boulder, Vicar and Rural Dean.

**PLATT—FOSTER.**—On Jan. 26th, at the Parish Church, Rotherham, Sec. Lt. Maurice Platt, R.F.C., elder son of Mr. and Mrs. W. Platt, of Grindleford, Derbyshire, was married to Dorothy, only daughter of Mr. and Mrs. W. H. Foster, of Rotherham, by the Rev. F. H. Sloman, M.A.

**VILLIERS—WHYTE.**—On Dec. 26th, 1917, at St. George's, Dublin, by the Rev. Fergus Greer, M.A., Stuart Arthur Villiers, R.F.A. and R.F.C., only son of Arthur Villiers, I.O.D., and Mrs. Villiers, Craig's Ville, Simla, India, was married to Violet Mary, eldest daughter of B. W. Whyte, Esq., and Mrs. Whyte, 39, Mountjoy Square, Dublin.

#### BIRTHS.

**DANIELL.**—On Jan. 25th, at 3, Sutherland House, Kensington, W., the wife of Lt.-Col. T. E. St. C. Daniell, M.C., R.F.C., of a daughter.

**ERRINGTON.**—On Jan. 20th, at St. Margaret's Hall, West Cliff, Bournemouth, the wife of Capt. G. H. Errington, North Staffs Regt., attd. R.F.C., of a son.

**ORTON.**—On Jan. 21st, 1918, at "The White Cottage," Helperby, Yorks, to Evelyn, the wife of Capt. John O. C. Orton, Norfolk Regt. and R.F.C., a son.

**SIMPSON.**—On Jan. 22nd, at "Dulworth," Collinette Road, Putney, the wife of Capt. C. H. Simpson, R.F.C., of a daughter.

#### FRANCE.

##### OFFICIAL COMMUNIQUÉS.

**JAN. 22nd.**—ARMY OF THE ORIENT.—British aviators bombarded the batteries and hostile establishments in the region of Seres and a train on the Seres-Drama railway (Struma front).

**JAN. 23rd.**—In the period from Jan. 11th to Jan. 20th, ten German aeroplanes were brought down either in aerial combat or by anti-aircraft guns.

In addition, it is confirmed that four German machines, reported as having been badly hit, were, as a matter of fact, brought down in the preceding period.

This brings to 19 the number of aeroplanes destroyed by our pilots between Jan. 1st and Jan. 10th.

**JAN. 24th.**—On Jan. 19th Lt. Fonck brought down his 20th machine.

**JAN. 25th.**—Two German aeroplanes were brought down during the day yesterday. One of these was brought down by our anti-aircraft guns.

**JAN. 26th.**—On Jan. 25th our aviators were particularly active. Numerous photographs were taken by our observers, who flew over the enemy zone as far as 30 kilometres (about 19 miles) behind their lines. More than 300 photographs were taken during the day.

Our fighting aviators brought down four German aeroplanes.

In addition, our bombing aviators effected various operations on the 25th and the night following. Eight thousand kilogrammes (about eight tons) of explosives were dropped on enemy establishments, notably on the stations at Thionville and Freiburg, in Breisgau, on the factories of the Baden Aniline Company at Ludwigshafen, and on the cantonments in the region of Longuyon.

Our anti-aircraft guns brought down three German machines on January 25th.

**ARMY OF THE ORIENT.**—In the region of Seres British aviators bombarded Bulgarian encampments and brought down one enemy machine.

\* \* \*

The correspondent of the "Daily Express" writing from Paris on Jan. 22nd, says:—

The possibility of Gotha raids on Paris during the present moonlight nights has called forth a warning from the authorities concerning the precautions to be taken. All factories are required to darken their windows, and many street lamps are being fitted with blue glass.

#### GERMANY.

##### OFFICIAL COMMUNIQUÉ.

**JAN. 26th.**—During the last four days 25 enemy aeroplanes were brought down in aerial fighting or by gunfire from the ground.

Our aviators carried out successful attacks on the north coast of France; in Dunkirk, Calais, and Boulogne good effects were observed.

Yesterday, within a few minutes, Lt. Roeth brought down in flames three French captive balloons.

#### ITALY.

##### OFFICIAL COMMUNIQUÉS.

**JAN. 24th.**—To the east of Clano (Montello) enemy aircraft dropped bombs without doing any harm.

**JAN. 25th.**—Hostile aerial activity, which was considerable from the Adige to the Brenta and along the Piave, was withheld on the front lines by bursts of machine-gun fire.

**JAN. 26th.**—The improved atmospheric conditions gave rise to great aerial activity on both sides. Our machines successfully bombarded the enemy's hutments and railway works at Cison and Primolano (Brenta Valley). Royal Navy seaplanes effectually bombed military objectives between Sile and Piave.

Our own and the Allies' squadrons, cruising and reconnoitring, several times attacked numbers of hostile machines, of which two were shot down by our aviators in the Mt. Zeblo region (east of Lake Garda) and in Val Sugana, and two others, at S. Fietro di Feltre (? Felletta, five miles north-west of Conegliano) and S. Fior (five miles north-east of Conegliano), were accounted for by British aviators, who also set two hostile captive balloons on fire in the neighbourhood of Conegliano.

Enemy machines dropped some bombs without doing damage on various portions of our trenches.

**JAN. 27th.**—Aerial activity was notable from Lake Garda to the sea. British aviators brought down two machines within the enemy lines and one in flames in the vicinity of Meolo.

Between 7 p.m. yesterday and dawn this morning enemy aircraft carried out repeated raids on the Plain between the Brenta and the Piave, especially on Treviso (20 miles north of Venice) and Mestre (six miles from Venice), where among the victims are to be counted three women and one (?) killed and three women wounded. The greatest material damage was that done to three hospitals at Mestre.

**JAN. 28th.**—Lively aerial activity along the whole front. A hostile aeroplane was brought down by British aviators. During the raid on the night of the 26th-27th inst. an enemy machine brought down by anti-aircraft batteries fell on the southern slopes of Montello (British front). The three pilots, who were uninjured, and included two officers, were made prisoners.

\* \* \*

Lt.-Col. Piccio and Major Baracca would seem to have taken the first and second places in the list of Hun-crashers here since July 15th, and to have thus merited the Pirelli awards with eleven and ten victories respectively up to Oct. 31st, though Baracca is ahead in the war record with some thirty planes down to his credit. Capt. Ruffo and Lt. Sabelli are third and fourth in the list, in spite of the latter's having been "missing" for some of the period.—T. S. H.

#### TURKEY.

##### OFFICIAL COMMUNIQUÉS.

**JAN. 21st.**—In a clever attack the "Sultan Selim," the "Midilli" ("Goeben" and "Breslau"), and some torpedo-boats advanced yesterday out of the Dardanelles, in order to destroy enemy forces which had been located near Imbros.

Lively aerial activity reigned on both sides. An enemy aeroplane was shot down in an aerial fight and a second was seriously damaged. The coastal batteries successfully bombarded enemy torpedo-boats.

**JAN. 24th.**—In the Irak (Mesopotamia) enemy aeroplanes undertook an attack on Kifri, one of them being shot down by our anti-aircraft guns. As retaliatory measures our aviators successfully attacked an enemy encampment near Kasr-i-Shirin (Dialah front). We captured a cavalry patrol.

**JAN. 24th.**—In the Dardanelles there was lively aircraft activity. Flt. Lt. Meinicke brought down an enemy aeroplane, which was burnt, the pilot being killed. A second enemy machine was damaged by Lt. Groners in an aerial engagement.

**JAN. 27th.**—Aerial activity continued to be lively in the Dardanelles.

**JAN. 28th.**—The Turkish cruiser "Sultan Selim" ("Goeben") entered [Dardanelles] yesterday (Jan. 27th). She is quite fit for service. The numerous enemy air attacks inflicted only unimportant damage to the funnel and the armoured plating, occasioned by two small bomb hits.

[One ventures to suggest that one skilfully handled torpedo-carrying seaplane would have abolished the "Goeben" permanently.—Ed.]

#### GREECE.

It is reported that a Greek naval aviator, named Hambas, has been killed while engaged with the British in bombing the "Goeben."

#### BELGIUM.

##### OFFICIAL COMMUNIQUÉ.

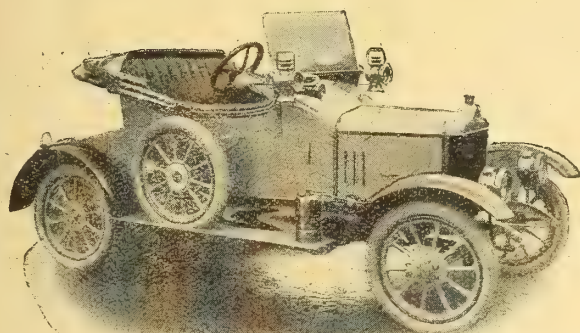
**JAN. 26th.**—German aviators dropped some 10 bombs in the neighbourhood of Adinkerke (between Nieuport and Dunkirk) without causing any damage.

#### HOLLAND.

A Reuter's message from The Hague on Jan. 26th states that the Dutch Foreign Office announces that the British Government has handed the Dutch Government 92,976 guilders as partial compensation for the damage done at Zierikzee on the night of April 29th by bombs dropped from a British aeroplane. This sum covers the material damage.



**Economy in Motoring**  
 is represented by just how far your requirements are met by the type of machine you purchase. Study for yourself the advantages offered in the  
**'STANDARD'**  
 Light Car and bear these in mind when we are able to resume deliveries. :: ::



**THE STANDARD MOTOR CO. LTD.**  
**COVENTRY**

London Agents, The Byfleetley Autocar Co. Ltd. 216, Gr. Portland St. W.

## BURBERRY CARAPACE AIR-SUIT

*Sheath Armour for  
Knights of the Air.*

The perfect one-piece Overall Suit to ensure warmth and protection.

**THE CARAPACE AIR-SUIT**  
 is made up of three layers, each of different material.

**THE OUTER COVERING**  
 is of Burberry Gabardine, so densely woven and proofed that it will withstand intense pressure from wind or rain.

**THE NEXT COMES**  
 an interlining of woollen fleece, giving maximum warmth with minimum weight.

**THE INNERMOST LINING**  
 is of glissade, which enables the airmar to slip into the suit quickly.

**THE SUIT IS RE-INFORCED**  
 by a double plastron of Burberry Gabardine across the chest and shoulders. The Burberry Puttee Collar, adjustable tabs, for tightening sleeves or trouser legs, waist-belt adding comfort and stability, and large pockets are further distinctive details. The helmet is of the latest approved Burberry pattern.

**THE WHOLE OUTFIT**  
 whilst affording efficient security, ventilates naturally, without the objectionable features of rubberproofs, oilskins or leather, and is much less weighty and cumbersome.

**R.F.C. AND R.N.A.S. KIT**  
 Burberrys supply Uniforms, Weather proofs and every detail of R.F.C. and R.N.A.S. equipment in cloths suitable for Europe or the East

**READY TO PUT ON**  
 Perfect fit is assured, as every garment is made in over 50 different sizes. Complete Outfits to Measure in 2 to 4 Days.



Military Catalogue sent on Request.

Every Burberry Garment bears a Burberry Label.

During the War **BURBERRYS CLEAN AND RE-PROOF** Officers' "Burberrys," Tielocks, Burfrons, & Burberry Air-Warms **FREE OF CHARGE.**

**BURBERRYS Haymarket S.W. LONDON**  
 & 10 Bd. Malesherbes, PARIS; also Provincial Agents

## AEROPLANE PARTS

Our 20 years' experience in making Rims and Tubular Parts for Cycles, Motor Cycles, etc., is now being utilised in the production of

**TUBES AND TUBULAR CONSTRUCTION.**

**SHEET METAL PRESSED PARTS** of every description.

**WHEEL RIMS AND SPECIAL SECTIONS IN STEEL** of any Length, Gauge or Width.

**BRAZING, ACETYLENE and ELECTRIC WELDING, etc.,**

We can also make any special parts to instructions. Send us your enquiries.

**THE LOMBARD**

**Rim & Tube Co.,  
 Lombard Street,  
 BIRMINGHAM.**

## P.D.V. Aircraft Company, Ltd.

All Metal Parts for Aircraft made, comprising the following machine work:

**MILLING, TURNING, SHAPING,  
 PRESS WORK, SLOTTING,  
 DRILLING, GRINDING AND  
 SHEET METAL WORK.**

Well-equipped Welding & Brazing Plant.

Enquiries to:

**P.D.V. AIRCRAFT CO., LTD.**

OFFICES AND WORKS—

**Princes Street, Richmond, Surrey.**

Telegrams: Aeros, Richmond.  
 Telephone: 1681 Richmond.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



A further communication is expected from the British Government respecting the indirect damage, which is estimated by Dutch experts at 27,033 guilders.

#### CANADA.

A message from the correspondent of "The Times" from Toronto on Jan. 25th, said that the Canadian Aviation Fund, of which Capt. D. A. Cameron, of the Bank of Commerce, is the treasurer, now exceeds £30,000. The fund provides for 16 aeroplanes, 10 of them training planes to be made and used in Canada, and six for operating against the enemy.

#### FROM DENMARK.

The Danish Correspondent of THE AEROPLANE writes:—

It is now confirmed that the well-known French pre-war pilot of Borel seaplanes, Geo. Chemet, who had been taken prisoner by the Germans, has been drowned while swimming across the Rhine in an effort to escape.

Another German old-timer, Wincsziers, with certificate No. 8, has been accidentally killed while flying as chief pilot of the Pfalz Aircraft Works. Twice he was in conflict with the law, being first sued for a high indemnification by the Albatros Co., the Antoinette-Gnome-engined products of which, built under licence, he refused to fly as contracted, stating them dangerous against his Blériot victory mount. The second time he had two years' penalty from robbing a girl of her money by love intrigue.

\* \* \*

Wincsziers' death offers a chance for reviewing the fate of the well-known old German civil aviators, many of whom have gone out during the three years of war.

While the Albatros altitude passenger-recordman Thelen is still a moving power of the Albatros firm, just as the victor of the 24 hours' competition Stöffler is technical director of the Aviatik Co., and as the second in this night overland national competition Schlegel was, until recently, with the Rumpler concern, so further the altitude recordman Oelerich is managing the German Aircraft Works in Leipzig-Linden.

On the other hand, Director Meier, the manager of the Kondor Works in Essen, has been killed on active service in a fight with a British aviator, the Duration Record pilot Bruno Langer has been killed on the Eastern front, the exhibition fliers, Lts. Höhdorf and Tweer, have been accidentally killed, and two other great pilots have also gone out, Schauenburg in the service of the A.E.G. Co., and Vollmöller in an experimental flight with a giant aeroplane.

\* \* \*

Fokker is still managing his aircraft works and flies occasionally daringly, while two former owners, the works of which were named after them, are no more connected with them, Otto and Jeannin to wit, the Otto Aero Works being now the Bavarian Aero Works, and the Jeannin establishment reading: Nationale Flugzeug Werke.

No late news is to hand of two names about which early war rumours were busy, thus, Hellmuth Hirth, then said to be a spy, and Casper, director of the Hansa Aircraft Works, said to be the first German aviator attacking England by a bomb-dropping visit to Dover.

Finally, three accidents have accounted for well-known old-timers: Reiterer, recordman of the Brandenburgische Aircraft Works, in a pupil school flight, Stiefvater by Berlin, and Kahnt at the Gotha Works.

#### ANTI-AIRCRAFT PERSONNEL.

It is reported that the recent decision to dispense with the services of the "half-time" men of the Anti-Aircraft Corps of the R.N.V.R., hitherto engaged in working the searchlights in London, has been taken solely in the interest of the London air defence.

It is fully recognised that the Volunteers engaged on this work have rendered valuable service, and an official acknowledgment of the fact may be expected at any moment. But those responsible for the air defence of the capital feel that, in view of the present development of aerial warfare, none but men of the highest efficiency should be employed on the vital task of working the searchlights. This efficiency, it is held, cannot readily be attained by men who—most patriotically, be it said—give their services at night, in many cases after an arduous day's work in civil occupations.

Hence the decision to employ in the future men who have received a thorough training and have attained the highest standard of effectiveness.

#### ENTHUSING THE PUBLIC.

Lt. C. R. Alston, R.F.C., who was flight patrol leader in France, is conducting a lecture tour in the north of England and Scotland on behalf of the Air Board.

The object of the lectures is to stimulate interest in and recruiting for the flying services. A very successful lecture has already been given in Edinburgh.

#### AIR RAID WARNINGS.

It is understood that the Chief Commissioner of Metropolitan Police is not particularly impressed with the work of the air raid patrols, which have sprung into existence in many parts of London with the object of giving warning to householders when an air raid is anticipated.

It is stated at Scotland Yard that scares have been created through the existence of these patrols, and in one or two instances prosecutions have followed. The authorities consider sufficient warning is given by the firing of signal maroons and the showing of red lights on the fire stations, while, at the same time, the local bodies have made every arrangement for providing shelter.

The Chief Commissioner has no legal power to interfere with these patrols, but it should be understood that persons creating unnecessary scares are liable to heavy penalties, which will be strictly enforced when evidence can be obtained.

#### THE ADJUSTMENT OF AIR POWER.

The "Daily Express" of Jan. 26th prints the following message from a correspondent, who says:—

"A prominent aviator told me yesterday that more has been done during the past six weeks to strengthen our air forces than many preceding months can show. The work of co-ordination proceeds apace, thanks to the tact with which Lord Rothermere and his colleagues have smoothed out the difficulties of the complex task they have undertaken.

"Tact" perhaps is not quite so much the *mot juste* as is "thoroughness."—Ed.]

#### THE PROTECTION OF CARRIER PIGEONS.

It is reported that during the last few weeks many homing pigeons have been shot by farmers and others who have mistaken them for wood pigeons, and in view of the serious results of the destruction of trained birds employed by the Government, whose homing pigeons are at work in all parts of the country, it has been found necessary to repeat the warning given some time ago against careless shooting, which may lead to the loss of birds engaged on service of the highest importance.

It is pointed out, in fact, that the work of the Government pigeons is sometimes literally a matter of life and death to our fighting men, many of whom owe their lives to the speed of the birds. A notable case was when a flying-boat and a hydroplane (seaplane?) got into difficulties in stormy weather, and it was feared that all-lives would be lost. A pigeon was sent out with a message calling for help, and in the face of a fierce wind the bird managed to make its way home. It died from exhaustion on arrival, but its message had been delivered, help was sent to the crews in danger, and the lives of all were saved.

The official warning to the thoughtless to avoid shooting homing birds is backed up by a reminder that heavy penalties may be, and in some cases have been, inflicted on offenders.

#### AERIAL PHOTOGRAPHY AND COLOUR VALUES.

Professor Pope stated at the Royal Institution on Jan. 26th that air photography for military purposes to-day is done with the aid of plates sensitive to the several colours of the spectrum. He said that during the past year or two important developments have taken place in that type of photography which cannot be publicly discussed at present.

#### SEAPLANES AS LIFE-SAVERS.

One of the agents of the British and Foreign Sailors' Society tells the following story, which illustrates how aviators may be useful to the Mercantile Marine:—

The crew of a British ship which had been torpedoed in the Mediterranean were in an open boat when the French pilot swooped down near them. "He dropped us his lifebelt," said one of the rescued men. "On picking it up we found a sheet of paper, upon which the following words were written: 'Cheer up, lads, I'll send for help.' On looking up again he was gone. At 10 o'clock we were picked up by a ship that had been sent to us for that purpose; after which we were landed at a certain place on the Tunisian coast."

#### A TRADE SUBSCRIPTION.

One of the most notable war models among those now on exhibition at Thomas Parsons and Sons in Oxford Street is to be offered to the public by raffle. This is a model of the aeroplane flown by Capt. (then Lt.) W. Leefe Robinson, V.C. Worcester Regt., attd. R.F.C., when he brought down the first enemy airship (a Schütte Lanz, not a Zeppelin) on British soil in 1916. The model was designed and made by the expert who prepares models for the naval and military authorities. It has been presented to the exhibition by Gen. Sir Alfred Turner, and the proceeds will be given to the War Seal Foundation.

#### PRESENTATION AEROPLANES.

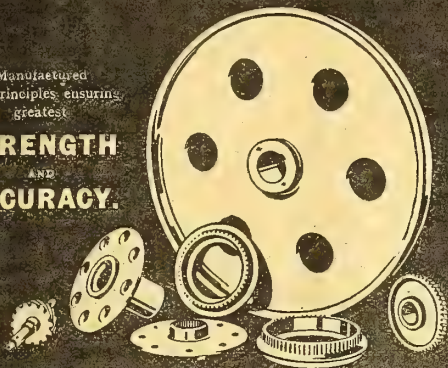
An additional sum of £2,250 has been collected in the Malay Peninsula for the purchase of an aeroplane for the R.F.C., which will be named "Malaya 35, the Chinese Loyalty."



# MOSS- AERO-ENGINE GEARING

Manufactured  
on principles ensuring  
greatest

**STRENGTH  
AND  
ACCURACY.**



**GEARING FLYWHEELS CAMSHAFTS**  
R.A.F. PROPELLER BOSSES

Our Aero parts are made in specially **HIGH TENSILE STEEL**, heat treated and all parts corrected for distortion.

**TRANSPORT, LORRY & PLEASURE CAR GEARING**

Bevel and Worm Drives accurately generated. Steering Worms and Sectors. Spur and Bevel Differentials. Gear Box Gears. Camshafts with guaranteed Glass-hard Cam Profiles.

## -GEARING

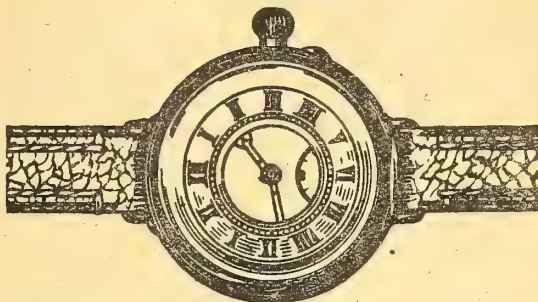
**THE MOSS GEAR CO., LTD.**

W. DUCKITT, Managing Director, Thomas St., Aston, BIRMINGHAM

JEWELLERS



SILVERSMITHS



Patent No. 11874/15.

### THE "MILITARY" LUMINOUS WATCH.

A THOROUGHLY reliable and practical luminous watch, indispensable for Naval or Military Service. The "Military" Luminous Watch is the only Screw Case Silver Watch fitted with a "hunter" cover, and is the exclusive patent of The Goldsmiths and Silversmiths Company, Ltd.

As illustrated.

**£4 12 6**

Without Cover.

**£3 15 0**

**THE GOLDSMITHS & SILVERSMITHS COMPANY, LTD.** with which is incorporated The Goldsmiths' Alliance Ltd. Established 1751

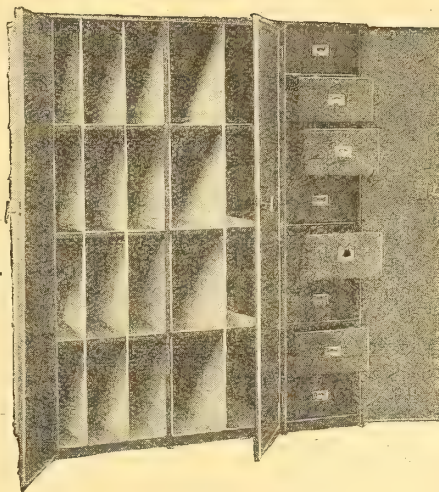
Only one Address (no branches):

**112, REGENT STREET, LONDON, W.**

THOMPSON BROS.  
(BILSTON), LTD.,  
— FOR —  
**UNDERCARRIAGES  
TUBULAR FRAMEWORK**  
AERO. DEPT., BILSTON, Staffs.



ANY SIZE. ANY TAPER. SPLIT OR SOLID.  
**FREDK. MOUNTFORD, Ltd.,**  
FREMOS WORKS, LIFFORD, BIRMINGHAM.



## SANKEY

Fireproof Steel Storage Bins  
Clothes Lockers, Tool Chests

Write for details:

**JOSEPH SANKEY & SONS, LTD.,**

Hadley Castle Works, Wellington, Shropshire.



## The United States Air Service Organisation.

The Intelligence Division of the Aviation Section Signal Corps issued some six months ago a very comprehensive plan of organisation, which is produced herewith, as sufficient time has now elapsed to prevent the information from being of value to the enemy.

In various passages the Aircraft Production Board is referred to as an organisation of purely advisory nature and without power to act, or it is stated that a given Division "may" consult with the Board.

This overlooks the almost unlimited power of the Council of National Defence and unnecessarily gives the impression that the Divisions do not co-operate closely with the Board. This should not be, and "Aerial Age" hopes that future bulletins from the Intelligence Division will state clearly that there is the closest of co-operation between the Aviation Section and the Board.

The statement issued by the Intelligence Division reads as follows:—

Aeronautical work in the Army is conducted directly by the Signal Corps, whether such lies under the heading "Aviation" or "Aerostation."

The Aviation Section (\*) of the Signal Corps is composed, originally, of officers and enlisted men of the Regular Army limited by law to a definite number.

Additional personnel is provided through the Signal Officers' Reserve Corps, the Signal Enlisted Reserve Corps, and the employment of civilians in instructive, advisory, administrative or other capacities.

Civilians may be employed (1) as such; (2) by passing standard physical and mental examinations and going through the routine of joining the Signal Officers' Reserve Corps, in which event, if satisfactory, they may be given commissions therein commensurate in grade with their attainments and duties, as follows: (a) Non-flying duty; (b) Flying duty or (3) by enlistment in the Signal Enlisted Reserve Corps.

The aeronautical work in the Signal Corps is supplemented by (1) the co-operation of the Navy in the Joint Army and Navy Board of Aero Cognizance,

(2) the Joint Army and Navy Board for Rigid Dirigibles,

(3) and Joint Army and Navy Board for Design and Specifications, which boards are responsible to the Secretary of War and the Secretary of the Navy respectively; and by co-operation of the

(4) Aircraft Production Board (a subsidiary of the Council of National Defence), and the

(5) National Advisory Committee for Aeronautics, which latter reports to the President of the United States.

The director of the Army aeronautical work is the Chief Signal Officer, acting through his Executive Officer.

The work is divided between various divisions, sections and sub-sections. Following are some notes on the duties of these various branches.

### 1.—AEROPLANE DIVISION.

Organisation and Training Section.—This Section has to do with the organisation of aviation school squadrons and of standard aero squadrons, the latter composed of graduated Reserve Military Aviators.\*\* It has nothing to do with training of men for aerostatic work, which is handled by the Balloon Division.

Graduates of the Schools of Military Aeronautics (ground schools) are assigned through the Aero Personnel Division in co-operation with the O. and T. Section, to the various aviation school squadrons for instruction in actual flying. From this point on the flying students are in charge of the O. and T. Section.

[Sixteen of these school squadrons were operating at the end of July, 1917. Belleville was to be in operation August 15th.

Following is a list of the location of aviation school squadrons then organised and to be organised in the near future:—

Mineola, N.Y.—operating.

Mt. Clemens, Mich. (Selfridge Field)—operating.

Fairfield, O. (Wilbur Wright Field)—operating.

Rantoul, Ills. (Chanute Field)—operating.

So. Mississippi Valley—under investigation.

San Antonio, Tex.—operating.

San Diego, Calif.—operating.

Belleville, Ills.—in operation August 15th.

One station to be in Rocky Mountain Region.

Fort Sill, Okla. (advanced school)—being established.]

At the above schools training is done with as much rapidity as possible. At the conclusion of from fifteen to twenty-five

hours' flying it is expected students will be able to pass the tests for certificates as Reserve Military Aviators.

While undergoing this flying instruction, the pupil is required to study radio, gunnery, photography, motors and aeronautical engineering. This study is practical; the student handling and operating every instrument, assembling and dis-assembling engines, and the construction and repair of aeroplanes to the extent that he must assemble, dis-assemble, line-up, etc. In the gunnery instruction, for instance, the student uses a machine in which a gun is mounted and is given target practice at objects moving in the air.

Upon receiving their certificates, these flying students are commissioned as First Lieutenants, Signal Officers' Reserve Corps, Aviation Section, and when on duty involving frequent or continuous flying, receive twenty-five per cent. increase in pay. The base pay is 2,000 dols. a year. When on foreign duty ten per cent. increase on the base pay is allowed. Quarters are also furnished.

Standard aero squadrons of the Army are formed at the aviation school squadrons. The flying and enlisted personnel for these squadrons are furnished from these flying schools. The officers, of course, are Reserve Military Aviators by this time, though some may be Junior Military Aviators. The enlisted men are of the Enlisted Reserve Corps, or of the Regular Army.

These aero squadrons, thus formed, will be fully equipped, save as to aeroplanes, and transported to England or France for advanced training.

These graduated aviators (R.M.A.'s) may also be sent to complete the complement of aero squadrons already in process of formation or partially filled, to be maintained at certain points.

[Aero squadrons were located at the end of July at the following places:—

#### HOME.

Columbus, N.M.; Gan Antonio, Tex.; Mt. Clemens, Mich.; Rantoul, Ills.; Fairfield, O.; Mineola, N.Y. (Reserve); Essington, Pa. (Reserve).

#### OVERSEAS.

Fort Mills, Corregidor, P.I.; Honolulu; Ancon, Canal Zone.

The foregoing, with two exceptions, were Regular Army aero squadrons as distinct from the Reserve Aero Squadron, which will be composed of Reserve Military Aviators solely].

It is not at the present time expected to utilise civilian training schools as it is planned that the aviation school squadrons will continue to be amply prepared to handle all flying instruction. No civilian schools are now in operation in connection with Army training.

Applications from officers in the Regular Army for transfer to flying duty are also received and preliminarily acted upon here and then passed to the Personnel Division. If all conditions are met, officers are sent to one of the aviation school squadrons for flying instruction.

These officers, when qualified, are rated as Junior Military Aviators and they receive fifty per cent. increase in pay when on flying duty.

A Junior Military Aviator, having served continuously three years as such on flying duty, may obtain the title of Military Aviator and be then entitled to seventy-five per cent. increase in pay when on duty involving frequent or continuous flying. Foreign service adds ten per cent., as usual.

The Organisation and Training Section, also, handles original applications for commissions in the S.O.R.C. from civilians, Regular Army, or National Guard officers and men, needed as supply, engineer, or field-inspector officers. Opportunity is afforded by personal interview to obtain first-hand knowledge of the particular attainments of each man. If preliminary investigation is satisfactory, the applicant fills out the blank and is turned over to the Personnel Division, which attends to the routine of physical and mental examination. Upon the obtaining of his commission he is assigned to such place as his services are required.

Equipment Section.—This Section makes out all purchase requests for equipment for all aero units except for local purchases. It adjusts differences between the manufacturers and the Government relative to equipment and determines what equipment shall be shipped to new organisations.

Intelligence Section.—The functions of the Intelligence Section are, broadly, the collection and filling of data of every nature and from all sources, relating to military aeronautics and aeronautical engineering and the making of such digests and publications as may be advisable to those interested for confidential and public information.

### 2.—AIRCRAFT ENGINEERING DIVISION.

The Aircraft Engineering Division, also reporting to the Chief Signal Officer, is divided into the following departments, in charge of an officer and a staff of commissioned assistants and civilian engineers and their assistants.

Aeroplane Section.—In this department is conducted work incident to status, design, specifications for aeroplanes, radio equipment, photographic equipment, instruments and accessories. The

\*It will be noted in printed matter of this Signal Corps, Aviation Section, that the title "Aviation Section" is used to embrace all aeronautical work in the Army. Since the publication of these pamphlets, the scope has been altered in accordance with this memorandum, as will appear obvious.

\*\*There are but a few officers with the title "Military Aviator" and "Junior Military Aviator." These are in administrative positions. Practically the entire new flying personnel is to be composed of Reserve Military Aviators.



# OFFICIAL ACCEPTANCE TESTS

## LAND MACHINES.

S.P.A.D.      Aero  
Sopwith      Armstrong-  
B.E.      Whitehead  
Short      D.H. 4  
Curtiss      Handley-Pegg  
Mann, Egerton      Bristol  
M. Farman      Vickers  
H. Farman      Nieuport  
Morane      Supermarine, &c.

## SEAPLANES.

Short, Sopwith, America Boats, F.B.A.  
Boats, Curtiss Boats, Norman-Thompson,  
A. D. Boats, &c.

*Private Aerodromes  
Surveyed and Pilots'  
Reports Furnished.*

## DELIVERY AND EXPERIMENTAL FLIGHTS ON LAND MACHINES & SEAPLANES.

COMPLETE REPORTS FURNISHED.

Rates on application to

## THE PRODGER - ISAAC

AVIATION COMPANY  
(C. B. Prodger and Bernard Isaac),  
166, Piccadilly, London, W.1.

Telephone: Gerrard 278 (2 lines.)

Telegrams: "Aeromnia, Piccy, London."

## CLIFFORD B. PRODGER

J. LANKESTER-PARKER,  
and other Pilots.

Approved Admiralty Pilots  
— for Acceptance Trials. —

## INSURANCE.

WE are now in a position to quote low rates, through our brokers at Lloyd's, for the Insurance of Aircraft during ACCEPTANCE TRIALS AND DELIVERY FLIGHTS with an excellent and most comprehensive Policy. May we quote you for your new contracts?

SPECIAL ARRANGEMENTS with Sub-Contractors for HANDLEY-PAGE Type Land Machines of "AMERICA" Type Flying Boats

## THE POOLE AVIATION CO. POOLE, DORSET.

Contractors to H.M. Government.

Spares and all Parts of Machines.

ENQUIRIES INVITED.

'Phone: Poole 54.

'Grams: Aviation, Poole

**Berling Magneto**  
insures a hot, fat  
spark at any  
altitude

Worth more  
Does more



Manufactured  
by the  
Ericsson Mfg. Co.  
Buffalo N.Y. U.S.A.

## MAKE MONEY BY WRITING

**£50 PRIZE.** Send postage (2d.) for particulars and copy of "How to Earn Money while Learning, How to write for Newspapers and Magazines." Practical and comprehensive Correspondence Courses—Fiction and Articles, etc. Expert Literary Directors. Constructive criticism. Beginners taught how to make work saleable. Exceptional testimonials. Address:

"EDITORIAL" (Dept. A.),

22, CHANCERY LANE, LONDON, W.C.2.

## Aeroplane Steel Sheets

as supplied by us to

The Royal Aircraft Factory  
and leading Aeroplane Makers

Guaranteed to comply with the R.A.F. No. 9A specification. Stocked in all gauges. (Sheets are passed and stamped by the "A.I.D.")

**BERNARD NICKLIN & CO.**  
IRON AND STEEL WAREHOUSE  
SMETHWICK, BIRMINGHAM

Telegraphic Address:  
"Bernico," Birmingham.

Telephone No. 1:  
224 Smethwick.

Telephone—Works: East 3833. Offices: City 89.

Telegraphic Address—"Gunsiguob, Estrand, London."

## THE STANDARD Aircraft Manufacturing Co., Ltd.

Office: SAVOY HOUSE, Corner of Savoy Street, STRAND, W.C.2.

Works at BOW COMMON LANE, LONDON. E.

**Auster**  
(1914) LTD

for **AUSTER-TRIPLEX SHIELDS**  
**AERONAUTICAL ACCESSORIES**

LONDON: 133, Long Acre, W.C.

BIRMINGHAM:

Crown Works, Barford Street.

Telephone: Regent 5910.  
Telegrams, "Winfecto, London."

Telephone: Midland 2123.  
Telegrams: "Auster, Birmingham."

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



testing of units of apparatus, instrumental apparatus, and other, is conducted under the supervision of the officer in charge and commissioned assistants of this department.

**Power Plant Section.**—In this department is conducted work (a) incident to the investigation and testing of new aircraft engine units in process of development by various manufacturers; (b) incident to standardising of power plant parts, such as propeller bulbs, magneto, couplings, fittings, etc.; (c) incident to special investigations in connection with engine manufacture outside of the field of members of the Inspection Section.

**Inspection Section.**—This department, although not fully organised, will involve the division of the country into districts, each district in charge of a commissioned officer reporting to the Officer in Charge of the Inspection Department. In each district, under the Officer in Charge, will be a commissioned officer in charge of more important factories, with corps of civilian engineers or others qualified for the work. The inspection involves all material and manufactured articles in connection with the Air Service of the Army.

**Transport Section.**—Within this department the special requirements of transport service incident to both heavier-than-air and lighter-than-air squadron operation are considered, and means adopted whereby the manufacturer of trucks and special equipment to meet all requirements are produced.

**Design and Experimentation Section.**—This department involves the conduct at Langley Field aeronautical proving ground, of about two thousand acres, near Hampton, Va., of all experiments and tests on (a) aeroplanes of various types; (b) aeroplane engines in production, in development, or of distinctly new types; (c) radio equipment of various types and for various uses in connection with aircraft operations; (d) ordnance—tests under this heading are carried on in conjunction with and under the supervision of the Chief of Ordnance, U.S. Army; (e) photograph experiments with all types of photographic apparatus in aeroplanes; (f) instruments and accessories.

All tests and experiments are carried out on conditions which simulate, as far as possible, the conditions met in actual service.

Langley Field, when completed, will include among other items, the following: administration building, hospital, quartermaster storehouse, commissary buildings, post exchange building, power house, 3 aeroplane hangar units, 2 seaplane hangar units, boat house, garage, truck shed, 2 barracks, laboratory, aeroplane construction shop, machine shop, foundry, three 200-foot observation towers, wind channel building, dynamometer building, engine test house and houses for commissioned, non-commissioned officers and civilians.

### 3.—FINANCE AND SUPPLY DIVISION.

The functions of the Division are the purchase of aircraft material of every kind in connection with aeronautics in the Signal Corps, and the payment therefor.

### 4.—AERO PERSONNEL DIVISION.

The duties of the Aero Personnel Division consist in matters affecting the commissioned and enlisted men of the Aviation Section of the Signal Corps, which may be more conveniently termed the Army Air Service. All communications to the Chief Signal Officer, or higher authority, that are concerned with the subject of aviation personnel must pass through this Division, except when such communications deal with civilian employees.

The personnel of the Army Air Service comprises the following groups:

- (a) Enlisted men of the Regular Army.
- (b) Signal Enlisted Reserve\* (throughout this article referred to as "Enlisted Reserve Proper").
- (c) Men (flying duty) enlisted temporarily in the Signal Enlisted Reserve in order to obtain training for a commission in the Aviation Section of the Signal Officers' Reserve Corps. (Throughout this article referred to as "Enlisted Reserve.")
- (d) Reserve Officers (flying duty).
- (e) Reserve Officers (non-flying duty).
- (f) Officers (of Regular Army).

The Aero Personnel Division is also concerned with two other groups of men:

- (g) Enlisted applicants of the Regular Army for transfer to the Air Service.
- (h) Commissioned applicants of the Regular Army for detail to the Air Service.

(a) Present provisions in regard to the first of these groups continue as now prescribed by law and Army regulations. The Aero Personnel Division has charge of the records of enlisted men of the Regular Army.

(b) The purpose of the "Enlisted Reserve Proper" has been to have a body of trained mechanics, machinists, electricians, chauffeurs and other qualified men, who may be quickly called in time of need. Cards giving the home addresses and information about the enlistments of such reservists are kept in the Aero Personnel Division. Similar information is in the service record of each reservist, in the hands of the department commander in whose territorial jurisdiction he resides. No more enlistments in

this group as reservists are made at present, there being no desirability during war-time in increasing the number of reserves not on active duty. The entire personnel of this group is at the date of writing being called into active service by the department commanders immediately upon enlistment. They are assigned to aviation stations and placed on training.

(c) The enlisted reservists who are applicants for commissions as reserve officers, flying duty, and are enlisted in the Signal Enlisted Reserve Corps simply for the purpose of preliminary training prior to receiving their commissions, comprise an extremely important group. From their numbers will come almost exclusively the aviators of the Army Air Service. The procedure in regard to the enlistment of these men is in the hands of the Aero Personnel Division. All applicants for commission in the Aviation Section of the Signal Officers' Reserve Corps must forward their applications to the Aero Personnel Division for approval or disapproval. If the application is approved, its sender is then given an examination to determine his physical condition, and another to test his moral, professional, and educational qualifications for a commission. Boards to give the complete examinations are situated at each of the Schools of Military Aeronautics, at the several Signal Corps flying schools in the United States and Washington.

If the candidate is successful in passing these examinations, he is re-examined with the view of enlistment as private, first-class, in the Signal Enlisted Reserve, and is then either sent home with a certificate of enlistment to await further orders, or sent immediately to one of the ground schools (Schools of Military Aeronautics) for instruction.

From this time until the receipt of his commission the candidate is under the jurisdiction of, first, the School of Military Aeronautics Division, and later of the Organisation and Training Division—the Aero Personnel Division being simply concerned with keeping his military record.

On recommendation of the Schools of Military Aeronautics Division, the Aero Personnel Division asks for the transfer to the ground schools of suitable students on duty at the Federal Reserve Officers' Training Camps. Such requests, if recommended, are made weekly.

(d) Upon successful completion of the flying school course, the candidate is commissioned as a reserve officer, whereon his relation to the Aero Personnel Division becomes like that of a regular officer of the Air Service.

Competent civilian flyers who pass the physical and mental examinations and are satisfactory otherwise, may be at once commissioned in the Signal Officers' Reserve Corps and ordered to active duty.

(e) Civilian applicants for commissions in the S.O.R.C. for non-flying duty in capacities such as engineers, supply or other officer, may take mental and physical examinations (the latter less rigid than that for flying duty), and if qualifications are satisfactory may be commissioned and ordered to active duty.

(f) All communications in regard to officers of the Army Air Service pass through the Aero Personnel Division. Similarly, all orders for officers of the Air Service that are requested from the Adjutant-General pass through this Division. Complete military records of officers are also kept there.

(g) Applications of enlisted men of the Signal Corps proper, or of other staff corps or departments, or arms, for transfer to the Air Service should be approved by the Aero Personnel Division, before orders are issued for such transfer.

(h) Any officer of the Regular Army who is an applicant for detail in the Air Service, has his military record and correspondence concerning him kept by the Aero Personnel Division while he is undergoing training at the Signal Corps flying schools. Upon detail in the Air Service the status of such an officer in relation to this Division is precisely like that of other officers of the Army Air Service.

In all cases, application for enlistment, transfer, detail or commission, is made direct to the Aero Personnel Division.

### 5.—SCHOOLS OF MILITARY AERONAUTICS DIVISION.

Successful candidates for flying duty are directed by the Aero Personnel Division to one of the eight ground schools located at the following institutions:

- Massachusetts Institute of Technology, Boston, Mass.
- Cornell University, Ithaca, N.Y.
- Ohio State University, Columbus, O.
- University of Illinois, Urbana, Ill.
- Texas University, Austin, Texas.
- University of California, Berkeley, Cal.
- Princeton University, Princeton, N.J.
- Georgia Institute of Technology, Atlanta, Ga.

Upon arrival, the S.M.A. Division is advised thereof, with a list, which list is kept by the S.M.A. Division in co-operation with the Organisation and Training Section. Now the students are under the charge of the S.M.A. Division.

Here the students serve eight weeks with the pay of a first-class private, about a dollar a day, and with an allowance of a dollar a day for rations. Quarters are provided in barracks.

Students are given intensive instruction in aeronautical engines, telegraphy, machine-guns, bombing and fighting, aerial

\*Inasmuch as all enlistments are for the period of the war and the policy of the office is to accept men for the Regular Army only. Paragraph (b) following is modified to this extent.



'Phone: CAMBS. 5.

THE

Wires: "CARBON," CAMBS.

## Cambridge School of Flying

30b, St Andrew's St., Cambridge.

beg to announce to **Manufacturers**,  
Engineers, Inventors, etc., that in addition to their

### FLYING COURSE (Prospectus on Application) and CORRESPONDENCE COURSE

(Thorough and Up-to-date tuition) they are prepared  
to undertake **Tracing, Preparation of Working Drawings,**  
**Detail Design, Patent Specification Drgs., etc.**

QUICK DELIVERY—CAREFUL WORK—MODERATE CHARGES.  
*Enquiries to "Design Dept."*

## THE BURTON AIRCRAFT

And MANUFACTURING Co., Ltd.

Aeronautical  
Engineers,

BURTON-ON-TRENT.

CONSTRUCTORS OF AIRCRAFT.

*Estimates given for all Parts.*

'Phone:—  
554 BURTON.

Telegrams:—  
PLANES, BURTON-ON-TRENT.

Manufacturers  
of ..

## PHOSPHOR BRONZE,

GUN METAL,

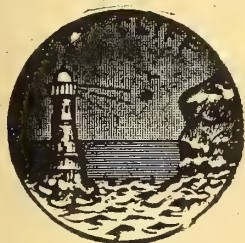
MANGANESE BRONZE,

BRASS & COPPER

TUBES, SHEETS,  
RODS, WIRE, AND

CASTINGS.

PHOSPHOR TIN,  
PHOSPHOR COPPER.



CHARLES CLIFFORD & SON, LTD.,  
BIRMINGHAM.

The Air Navigation Co., Ltd.

## BLERIOT & SPAD AIRCRAFT WORKS, ADDLESTONE (SURREY).

**Contractors to War Office and  
Admiralty.**

Flying Ground—Brooklands Aerodrome.

NORBERT CHEREAU, Managing Director.

Telegrams—Bleriot, Weybridge. Telephone—353 Weybridge.

## "CROID"

LIQUID GLUE

'Approved' by 'A.I.D.'

Sole Manufacturers:

The Improved Liquid

Glues Co., Ltd.,

Gt. Hermitage Street

London, E.

Contractors to H.M.

Government.

## CLABOUR-WESTBAY

:: FOR ::

## 2.B.A. Bolts—A.G.S. 103

Entire Output at present absorbed  
—by Government Requirements.—

**W. A. Clabour, Westbay & Co.,  
KIRKSTALL, LEEDS. Ltd.**

Phone: Headingley 709.

Telegrams: Clabour, Kirkstall.

## SALMSON AERO-ENGINES

(Canton-Unné System).

All enquiries should be addressed to

**THE DUDBRIDGE IRON WORKS, L<sup>d</sup>**  
**STROUD,**  
**GLOUCESTERSHIRE.**

London Office:

87, Victoria Street, S.W.1.

## Aluminium Castings

*Sand or Die  
of every  
Description*  
2 H.P. to 600 H.P.  
BEST METAL  
GOOD CASTINGS  
QUICK DELIVERIES



Contract L to  
H.M. Government

**Chill Castings for  
Aeroplanes a Speciality**

Telephones: 3946 City. Telegrams:  
3946 City. Kankases,  
4879 Central, Isling, London

**R W COAN**  
*The Aluminium Foundry*  
219, GOSWELL ROAD,  
LONDON, E.C.

COAN  
CASTS  
CLEAN  
CRANK  
CASES



observation and co-operation with artillery and infantry, including map-reading, contact patrol and reconnaissance; army regulations and military subjects; flying, with meteorology, instruments, compasses, photography and other; rigging, care and repair of aeroplanes, engines and cameras. Guns and other apparatus are provided for practical study. Upon completion of this course the students are assigned through the Aero Personnel Division to the aviation school squadrons, as noted under "Organisation and Training."

#### 6.—CONSTRUCTION DIVISION.

The functions of the Construction Division are: the locating of sites for flying schools and squadrons, preparing deeds or leases and entering into contracts for the preparation of the ground and the construction of buildings. This Division may consult other departments, such as the Aircraft Production Board, for instance, but the actual control of these operations is in its hands. Once the field is completed and in shape for the purpose for which it is intended, its operation is taken up by the Aeroplane Division, Organisation and Training Section.

#### 7.—BALLOON DIVISION.

The Balloon Division has charge of all matters pertaining to lighter-than-air craft. Captive ballooning is being developed; first for the reason that observation balloons are urgently needed abroad. The training of pilots and observers for captive balloons involves a preliminary course in free ballooning, using the ordinary spherical type. This is necessary for the reason that when captive balloons break away from their holding cables, they must be manoeuvred and landed safely in the same manner as spherical balloons.

The principal army balloon school is at Fort Omaha, Nebr., the entire post being utilised for this purpose. At St. Louis, the Missouri Aeronautical Society is also training balloon pilots at a civilian balloon school in accordance with special regulations No. 50, War Department, and it is possible that one or two additional civilian balloon schools will be utilised in the same way. It is expected that the ballooning instruction at the Fort Omaha school will progress from the captive ballooning to dirigibles as soon as practicable.

The principle function of observation balloons is, first, to keep constant watch of everything of military interest in the sector of the enemy's territory which is assigned to each balloon, and observing and reporting the fall of artillery projectiles. Reports from the balloon to the ground are by telephone connection.

#### 8.—RADIO DIVISION.

The Radio Division deals with the organisation and operation of radio work in completed aero squadrons or aviation school squadrons and practically applies the results of the work conducted by the Aircraft Engineering Division.

#### AIRCRAFT PRODUCTION BOARD.

The function of this board, organised by the Council of National Defence, is to consider the situation in relation to the quantity production of aircraft in the United States and to co-operate with the officers of the Army and Navy and of other departments of the Government interested in the production and delivery to these departments of the needed aircraft in accordance with the requirements of each department.

This board has no legal authority and its work is advisory only, but its recommendations are made effective through the Finance and Supply Division, which asks the approval of the Aircraft Production Board as to the qualifications of the manufacturer to whom it is tentatively about to award a contract. The programme is outlined as follows:

**Engineering.**—To co-operate with the Aircraft Engineering Division of the Army (and with the correlative branch of the Navy); with all manufacturers, engineers and laboratories to advance the science of aviation and aerostation and to stimulate the production of better types of aircraft.

**Specifications and Standardisation.**—To advise and assist in such standardisation of material and parts, and, as far as practicable, of types of aircraft as will aid in increasing the productive capacity of the industry in the most efficient forms of aircraft.

**Production.**—To investigate sources of supply of aircraft and their materials and to assist in the formulation and execution of such plans as may be necessary to enable the Government to purchase all kinds of aircraft of the types in the quantities desired. This includes:—

(a) Co-ordination of designs of all aircraft matters through officers of allied countries stationed here for that purpose.

(b) Arrangements with existing American factories as to kinds of aircraft and their component parts best suited to their organisation and facilities and quantities to be built by them.

(c) Suitable arrangements, when necessary, to advance Government funds where larger contracts are considered than can be privately financed, or to make arrangements on a cost-plus basis.

(d) Utilisation of such idle facilities and the erection of such new sources of supply as, in the judgment of the board, are necessary to meet the needs of the Government.

**Inspection.**—To co-operate with the aeronautic inspection organisation of the Army and the Navy and start to assist in

co-ordination of their present systems of inspection to the end that, if possible, there be one system, one standard and one organisation for the inspection of aircraft in this country.

**Aviation Schools.**—Following the selection of sites, to advise in regard to buying or leasing the land, the preparing it for use and the erecting of buildings.

**Supply Depots.**—Following the approval of sites, to advise in regard to the leasing of land and erecting the necessary buildings.

**Priority.**—To advise regarding the priority of deliveries of aircraft material as between the departments in accordance with the general policy as determined by the Council of National Defence.

#### JOINT ARMY AND NAVY BOARD OF AERONAUTICAL COGNIZANCE.

This joint board was organised with representatives of the Army and Navy as members for the purpose of formulating plans and regulations for joint development and to settle broad questions arising between the two services, distinctive insignia, respective responsibilities and spheres of action, methods of co-operation, joint manoeuvres and various other allied subjects.

#### JOINT ARMY AND NAVY BOARD FOR RIGID DIRIGIBLES.

The specific purpose of this board is the design and construction of a rigid dirigible. This work is being prosecuted in the Navy Department.

#### JOINT ARMY AND NAVY BOARD OF DESIGN AND SPECIFICATIONS.

This is another joint technical board, composed of Army and Navy officers and has to do with the decision as to respective types of aircraft.

Chief Signal Officer: Brigadier-General George O. Squier.

Executive Officer: Colonel C. McK. Saltzman.

#### AEROPLANE DIVISION.

Lieut.-Colonel Jno. B. Bennett, Major B. D. Foulois. Organisation and Training Section: Capt. T. D. Milling, Lieut. Philip J. Roosevelt, U.S.R. Intelligence Section: Major H. H. Arnold, Lieut. Ernest Jones, U.S.R. Equipment Section: Capt. L. H. Brereton, Capt. J. W. Gallagher, U.S.R.; Lieut. S. Katzman, U.S.R.

#### AIRCRAFT ENGINEERING DIVISION.

Major Henry Souther, U.S.R.; Capt. G. R. Wadsworth, U.S.R. Airplane Section: Capt. V. E. Clark, Capt. H. S. Martin. Inspection Section: Capt. H. W. Harms (field), T. W. Mixer (raw material), B. D. Gray (finished material). Power Plant Section: Capt. Howard Marmon, U.S.R. Transport Section: A. J. Slade. Design and Experimentation Section: Capt. H. S. Martin (Aeroplanes), Capt. V. E. Clark (Aeroplanes), Capt. Howard Marmon (Engines), Capt. C. C. Culver (Radio), Capt. R. H. Willis, Jr. (Ordnance), Capt. C. C. Culver (Photography), Capt. H. S. Martin (Instrument and Accessories).

#### FINANCE AND SUPPLY DIVISION.

Capt. A. G. Gutensohn, Capt. R. M. Jones, Lieut.-Colonel C. S. Wallace, Capt. George H. Brett, Capt. L. R. Evans, Capt. H. D. Moore.

#### AERO PERSONNEL DIVISION.

Capt. Aubrey Lippincott, Capt. W. A. Larned, U.S.R.; Capt. R. B. Owens, U.S.R.; Capt. Thomas H. McConnell, U.S.R.; Lieut. Arthur Hadley, Jr., U.S.R.

#### SCHOOLS OF MILITARY AERONAUTICS DIVISION.

J. C. Farrar, Major Hiram Bingham, U.S.R.; Russell MacDonald, Capt. Frank C. Page, U.S.R.

#### CONSTRUCTION DIVISION.

Capt. C. G. Edgar, U.S.R.; Capt. C. S. Benton, U.S.R. (Transportation); Capt. K. C. Grant, U.S.R. (Engineering); Capt. H. Bennington, U.S.R. (Auditing-Accounting).

#### BALLOON DIVISION.

Lieut.-Colonel Charles de F. Chandler, Capt. J. C. McCoy, U.S.R.; Lieut. B. D. Daggett, U.S.R.; Lieut. Paul Pleiss, U.S.R.

#### RADIO DIVISION.

Major N. H. Slaughter, U.S.R.; Capt. C. C. Culver.

#### AIRCRAFT PRODUCTION BOARD.

Howard E. Coffin, Chairman; Brigadier-General G. O. Squier, Rear-Admiral David W. Taylor, Arthur G. Cable, Secretary; Sidney D. Waldon, E. A. Deeds, R. L. Montgomery.

#### JOINT ARMY AND NAVY BOARD OF AERO COGNIZANCE.

Brigadier-General G. O. Squier, U.S.A.; Capt. J. S. McKean, U.S.N.; Major S. M. Embick, U.S.A.; Capt. V. O. Chase, U.S.N.; Capt. G. S. Marvell, U.S.N.; Major D. T. Moore, U.S.A.

#### JOINT ARMY AND NAVY BOARD FOR RIGID DIRIGIBLES.

Rear-Admiral David W. Taylor, U.S.N.; Lieut.-Colonel Chas. DeF. Chandler, U.S.A.; Capt. V. E. Clark, U.S.A.; Brigadier-General G. O. Squier, U.S.A.; Lieut. J. H. Towers, U.S.N.; Lieut. W. G. Child, U.S.N.; Assistant Naval Constructor, James C. Hunsaker.

#### JOINT ARMY AND NAVY BOARD OF DESIGN AND SPECIFICATIONS.

Lieut. A. K. Atkins, U.S.N.; Lieut. J. H. Towers, U.S.N.; Assistant Naval Constructor, J. C. Hunsaker, U.S.N.; Major B. D. Foulois, U.S.A.; Major Henry Souther, U.S.R.; Capt. H. W. Harms, U.S.A.



# THE "BOWSER" AEROPLANE SEATS

(Made to A.G.S. Drawing 264).

Supplied to the Royal Aircraft Factory and the Leading Aircraft Manufacturers.

Manufactured by **EDWARD BOWSER, 50, Park Lane, Leeds.** Tel. No.: Central 3473.

Under the A.I.D. Inspection.

Northern Representative—  
Mr. **WALTER M. DANIELL,**  
33, East Beach, Lytham.

## CRADOCK'S STRANDS & CABLES

Manufactured from Tinned Steel Wire of the Highest Quality.

CONTRACTORS TO HIS MAJESTY'S GOVERNMENT.

**GEO. CRADOCK & CO., Ltd.,** Head Office **WAKEFIELD.** London Office: 7, East India Avenue.

**EBORA**  
PROPELLER  
Company  
11 & 12 Surbiton Park  
Terrace **KINGSTON**  
30a Thames  
Telephone  
**KINGSTON 672**  
Telegrams  
**EBORA, KINGSTON**

# Ebora Propellers

Contractors  
to the Admiralty  
and War Office  
**SCHOOL PROPELLERS**  
**FOUR BLADES**  
**SEAPLANE PROPELLERS**  
**SLATE TABLES FOR**  
**PROPELLER WORKS**

## RUBBER P.R. TUBINGS APPROVED A.I.D.

'Phone:—CITY 3811 and 3812.

WASHERS, RINGS, BUFFERS, SHEET, STRIP, MATTING, MOULDINGS.

**JAMES LYNE HANCOCK, Ltd., 266 Goswell Rd., London, E.C.1**

20 "TELEGRAMS:"  
"EDIBRAC," PHONE,  
"LONDON."

## IMPERIAL LIGHT LTD.

TELEPHONE:  
3540 VICTORIA  
(3 LINES).

123, VICTORIA STREET, LONDON, S.W.1.

FOR

## FLUXES FOR WELDING

## HEATING

By Steam or Hot Water

**HANGARS, DOPE SHOPS & AIRCRAFT WORKS**

and a complete system of

**CHAS. P. KINNELL & Co., Ltd.,**  
65, Southwark Street, London, S.E.1.

## VENTILATION

## HIDE GLUES

**FOR AIRSCREWS AND**  
**AIRCRAFT CONSTRUCTION.**

— APPROVED BY H.M. ADMIRALTY AND A.I.D. —

Manufacturers—**Wm. OLDROYD & SONS Ltd., 9, Mincing Lane, London, E.C.3.**

Telephone: 4978 Avenue.

## STANLEY PROPELLERS

By the **STANLEY AVIATION CO.,**

TELEPHONE  
DALSTON 45.

**CHATHAM PLACE, MORNING LANE,**  
**HACKNEY, LONDON.**

GOVERNMENT  
CONTRACTORS.



## TRADE CARDS.

## AEROPLANE TIMBER SPECIALISTS

**JOSEPH OWEN & SONS, Ltd.,**  
**Borough Saw Mills, LONDON, S.E.**

Telephone: HOF 8811 Telegrams: "BUCHERON, SEDIST."

## TIMMS ENGINEERING WORKS

Makers of Jigs, Fixtures, and Special  
 Tools; also Aero Engine Components  
 and Gearing in quantities.

8a William St., West Kensington, W.14

## JAMES NORTH HARDY &amp; SON, LTD.,

54, PORTLAND STREET, MANCHESTER,  
 MANUFACTURERS of all descriptions of COTTON and LINEN  
**WEBS, TAPES & TWINES FOR AIRCRAFT  
 AND ELECTRICAL WORK.**

London Branch: 3, FITCHETT'S COURT, NOBLE STREET, E.C. 4.  
 Mills: HEATON PARK, nr. MANCHESTER.  
 Tel. Ad.: "Hardson," Manchester Phone: No. 6471 Central.

Trade **MENDINE** Mark.

## LIQUID SCOTCH GLUE

USED BY THE LEADING AEROPLANE CONSTRUCTORS.  
 MOISTURE PROOF.

Write for Price List and Particulars

MENDINE CO., 8, Arthur Street, London Bridge, E.C. 3.

## Chauvière's famous Integral Propellers

HOLD ALL RECORDS; USED BY ALL  
 LEADING AVIATORS. THE BEST

Sole Proprietors for Great Britain and Colonies

**THE INTEGRAL PROPELLER CO., LTD.,**  
 Edgware Road, The Hyde, Hendon, N.W. 9.

Telephone—Kingsbury 104. Telegrams—"Aviprop, Hyde, London."

## EBORA PROPELLER COMPANY LTD

*Ebora*

## PROPELLERS

Contractors to the ADMIRALTY & WAR OFFICE  
 11 & 12 SURBITON PARK TERRACE, KINGSTON-ON-THAMES  
 Telephone: KINGSTON 672 Telegrams: "EBORA, KINGSTON"

ALWIN ENGINEERING CO., AERONAUTICAL  
 ENGINEERS,  
 LUTHER ROAD, TEDDINGTON, S.W.

Tel. No. Kingston 2412.

Makers of all kinds of Aircraft Fittings. Presswork a Speciality  
 Pressings for DeH4, 5, 6, 9, etc. AVRO, SOPWITH, FAIREY and  
 many other types.

On receipt of Post Card our Representative  
 will call and give immediate quotation.

## Springs! Springs! Springs!

We make a speciality of  
 Springs for Aeroplanes.  
**SEND FOR PRICES.**

**Dart Spring Co., West Bromwich.**

METRIC BOLTS & NUTS (5 m/m to 8 m/m).  
 Stock Lists on Application.

## CASHMORE BROS.,

TELEPHONE: **Zeta** HILDRETH ST.,  
 415 BATTERSEA **Works** BALHAM, S.W.

Screw-Cutting and Light Engineering. Accessories for Aircraft,  
 Electrical and Motor Trades. Brass and Iron Founders.

## SAVE TIME.

## H. DUNSHEATH &amp; CO.,

Makers of Every Description of  
 STEEL MARKS, DIES, LETTERS, FIGURES, BRASS  
 STAMPS AND IRON BRANDS.

Seals, Brass, Tin and Zinc Labels, Time Checks, Stencil  
 Plates, Brass Name Plates, Rubber Stamps, &c.

**30, ARUNDEL STREET, SHEFFIELD.**

*Advertising*

For GOOD ADVERTISING consult  
 Godbolds, 8, Breams Buildings,  
 London, E.C.4. Estimates Free.  
 Phone: City 6912. E. H. Godbold,  
 Director



**SCREW-DRIVING**  
 RUSSELL BROTHERS, Ltd., REDDITCH  
**MACHINES.**

## FREDK. WARD

— FOR —

## Aero Engine and Gun Gear Parts

ALSO PATTERN AND JIGS.

ALLSOP ST., UPPER BAKER ST., N.W.  
 Phone: Paddington 4743.

KINDLY MENTION "THE AEROPLANE"

WHEN CORRESPONDING WITH ADVERTISERS.



## MISCELLANEOUS ADVERTISEMENTS.

## Situations Wanted—continued.

**Draughtsman**, with previous experience of aeroplane works, seeks situation with aeronautical firm.—Box No. 3316, THE AEROPLANE, 166, Piccadilly, W.1.

**Designer or Technical Manager**. Advertiser, A.F.Ae.S., A.M.I.C.E., fifteen years' engineering experience, including six years with leading aircraft firms, will be open shortly to consider engagement as above. Fully conversant with Air Board requirements and methods. All types of seaplanes and land machines, including stressing and performance calculations. First-class offers only entertained.—Box 3320, THE AEROPLANE, 166, Piccadilly, W.1.

**Engineer** seeks position of responsibility; practical experience of aero engines and manufacture of parts.—Box 3318, THE AEROPLANE, 166, Piccadilly, W.1.

**Works Manager**, disengaged, requires similar position in aircraft factory. Good practical man and splendid organiser. Moderate salary and commission on production.—Write, Box 3319, THE AEROPLANE, 166, Piccadilly, W.1.

**Works or General Manager** desires post with good progressive firm; thorough knowledge land machines and seaplanes. Sound organiser on modern lines. Tactful and energetic. Large experience in similar position. Best references. Good commercial abilities. Salary bonus on results preferred. Free at short notice.—Box No. 3304, THE AEROPLANE, 166, Piccadilly, W.1.

**Progress, Production, Records, etc.**, responsible position required in aircraft factory. Will undertake to organise department upon sound modern lines.—Box No. 3309, THE AEROPLANE, 166, Piccadilly, W.1.

**Aero-engine Manufacturer** (A.F.Ae.S.) is open for engagement. Specialist in: (1) Mass production of accurate components, (2) gauge and tool manufacture, (3) machine tool design, (4) scientific heat treatment of high tensile steels, (5) lay-out of plant for aero engine manufacture. Capable controller of labour. Energetic and keen for production. Temporary or permanent engagement.—Box No. 3314, THE AEROPLANE, 166, Piccadilly, W.1.

**Viewer**, experienced in aircraft woodwork, or charge of female labour.—Alpha, 6, Torbay Road, Willesden Lane, N.W.

**Viewer**, aeroplane wood parts; considerable cabinet making and joinery experience. Age 41. Wages, 1s. 3d.—Box No. 3307, THE AEROPLANE, 166, Piccadilly, W.1.

## AVIATION

## AVIATION INSTRUCTION

on up-to-date lines, by a qualified Engineer in Aeronautics. Demonstrations from complete set of parts, and sectioned models.

Send for Prospectus No.1.A.,

THE MOTOR TRAINING INSTITUTE LTD.,

10, Heddon Street, Regent Street, W.1.

## WANTED.

**Tanks**.—Sheet metal work wanted. Well-equipped up-to-date factory in London open for contracts.—Apply Box No. 3311, THE AEROPLANE, 166, Piccadilly, W.1.

**Wanted, Gap Lathe**, about 6in. centre cutting (metric), hollow spindle preferred.—Particulars to "B.", 21, Sheldon Road, Cricklewood, N.W.

**Shackle Stampings**.—Will firms quote price and delivery dates for B. and C.—Box 3321, THE AEROPLANE, 166, Piccadilly, W.1.

**Wanted**, 48-inch Air Container to stand high pressure. State price.—H. Ellingworth, Great Pettitts, Romford, Essex.

**Wanted Woodwork** for aeroplanes, very large up-to-date factory, fully equipped with latest machines; any class of aircraft work under taken; prompt deliveries; best work.—Apply Box 3030, THE AEROPLANE, 166, Piccadilly, W.1.

**Engineering Firm** with well-equipped machine shops, now engaged on munitions, solicits inquiries for all classes of turning, drilling, grinding, milling, fitting, etc. Aircraft fittings, also copper pipe work, a speciality. Correspondence with a view to post-war business especially invited.—The Lankester Engineering Co., 39, Eden Street, Kingston-on-Thames.

## MISCELLANEOUS.

**Nerve Failure** speedily cured, self-consciousness eliminated, concentration increased, and confidence restored by sympathetic hypnotic suggestion. Interesting explanatory booklet post free.—Robert McAllan, Regent House, Regent Street, W.1.

"Military Aeroplanes," by G. C. Loening. Sixth Edition now ready, 21s., post free, 21s. 6d.—The Wm. Dawson Publishing Co., 2, Breems Bldgs., London, E.C.

## AIRCRAFT PARTS.

**Hardwood for Aeroplanes**.—Specially Selected air-dried timber as supplied to leading constructors in Britain and the Continent. Silver Spruce, Ash, Poplar; Hickory and Ash Skids; Three-ply; Thin Cedar and Mahogany for Floats; Walnut for Propellers.—William Mallinson and Sons, Ltd., Hackney Road, 'Phone, 3845 Central, 4770 Wall.

**Tapes, Webs, Cords and Threads** in all qualities, suitable for Aircraft Work. Delivery from stock.—John MacLennan and Co., 30, Newgate Street, London, E.C.1. (See Advertisement Page 494 and Buyers' Guide.)

**Aeroplane Seats** to any drawing or specification. Prompt deliveries.—F. C. Chappell, Cane Works, 9, Fisher Street, Nottingham.

**Aeroplane Seats**. We can give quick delivery of cane seats, A.G.S. 264 or other patterns, guaranteed pass inspection. Write us for anything required in cane work.—The Willowbrook Company, Leicester.

**Petrol Cocks**, over 30 patterns made, tee, elbow, cross, "Y" pieces and unions, etc., for all petrol components.—Apply to H. Burton and Co., Ltd., Cannon Works, Willesden, N.W.10.

## FOR SALE

**R.N.A.S. Flight Officer's Kit**: Helmet, 2 pairs puttees, goggles, gloves, breeches, 50s.—Barton, 180, Stockwell Road, S.W.9.

**Sites for Aircraft Works and Aerodromes**. Manufacturers requiring the above in the Western Suburbs of London should avoid delay and waste of time in seeking same by applying to Messrs. Tyser, Greenwood and Co., Surveyors, 360, High Road, Chiswick, who will be pleased to forward particulars of excellent sites and give fullest details and plan on application at their offices, 360, High Road, Chiswick, W.

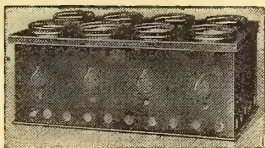
**Aeroplane Radiators**.—The Gallay Radiator Company, Limited, stock Aeroplane Radiators. For the benefit of Constructors, can supply radiators for experimental purposes at a nominal cost. Advice given on suitable types for the various approved engines. Our drawing office is always at our clients' disposal.—198, Great Portland Street, London, W.1.

## ENGINEERING.

**British School of Aeronautics**.—Aircraft Engineering Course; Aero Design; Aero Construction; Aero Draughtsmanship; Mechanical Engineering.—Pennington's, 254, Oxford Road, Manchester.

GLUE POTS (any shape or size).

GENERAL  
SHEET  
METAL  
WORK.



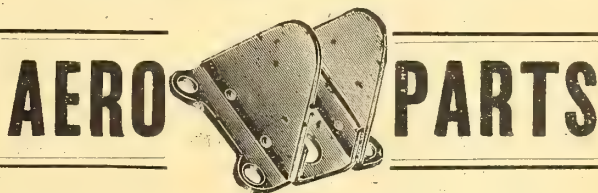
PETROL  
TANKS,  
Etc.,

OXY-ACETYLENE WELDING.

ARTHUR HILL & CO.,  
SILCHESTER ROAD,  
LONDON, W.10.

'Phone—PARK 1443.

Toolmaking, Diesinking,  
Stamping, Presswork.



WILLIAM MILLER,  
131½, Gt. Hampton St.,  
BIRMINGHAM.



## MISCELLANEOUS ADVERTISEMENTS.

**SPECIAL PREPAID RATE:** 18 words 1/6; Situations Wanted ONLY, 18 words 1/-; 1d. per word after. **TRADE ADVERTISEMENTS** in these columns, 3 lines 3/-; 10d. per line after. Public Announcements, Legal Notices, Auctions Contracts, etc., 16 per line. For the convenience of Advertisers, replies can be received at the offices of "THE AEROPLANE" 166, Piccadilly, London, W.1.

## PATENTS.

**PAGE & ROWLINSON**, Chartered Patent Agents (Consulting Engineer, Mr. S. E. Page, A.M.Inst.C.E.), 27, Chancery Lane, London, W.C. Tel. 332 Central.

**Henry Skerrett**, Chartered Patent Agent, 24, Temple Row, Birmingham.—Patents, trade marks, and designs.

**Inventors advised free.** Write for booklet.—King's Patent Agency, Ltd., 165, Queen Victoria Street, London. 30 years' references.

**Stanley, Popplewell and Co.**, Patent Agents and Consulting Engineers. Applications for Patents attended to in all countries.—38, Chancery Lane, W.C. Telephone: 1763 Central. Circular free.

## SITUATIONS VACANT.

**Wanted, Sheet Metal Workers**, fitters, and turner-fitters, must be first-class men. No one on Government work or residing more than ten miles away need apply to:—Harley Works, Beckton Road, Plaistow, E.16.

**Fitters—Aircraft.** Wanted immediately for the metal-working department of a large new aircraft factory on the South Coast. Must be experienced tube and general metal workers, for making and assembling detail metal parts. Good opportunities for the right type of men. No one on Government work need apply.—Apply in first instance, stating experience and wages required, to nearest Employment Exchange, mentioning this paper and Box No. 3272.

**Wanted at once** in large progressive aircraft factory, experienced and energetic erection shop foreman, used to tactful handling of men. No one on Government work need apply.—Applications must be made through nearest Employment Exchange, mentioning this paper and Box No. 3292.

**Wanted immediately** a competent Draughtsman to take charge of drawing office work for a firm about to manufacture aeroplanes (engines excluded) to Government designs under A.B. control. No person on Government work will be engaged.—Apply, in first instance, to your nearest Employment Exchange, quoting THE AEROPLANE and No. 3306.

**Wanted, First-class Manager** for metal department of small aeroplane works near London. No one already engaged on Government work need apply.—Applications must be made through your nearest Employment Exchange, mentioning this paper and No. 3305.

**An Important Company engaged** in sheet metal work is prepared to entertain an arrangement with smart men who can inaugurate departments. Applications will only be considered from technical men who have been employed in responsible positions and can carry contracts through in their entirety. The firm is well equipped as regards tools, presses, etc., and up-to-date methods of production. To men who put forward a business proposition every assistance will be given on the basis of good salary and profits realised. Write Box 9301, care of A. J. Wilson and Co., Ltd., 154, Clerkenwell Road, London, E.C.1.

**Wanted, Designer** for aeroplane propellers. Fine opportunity for first-class man. No one already on Government work or residing more than 10 miles away need apply.—Previous experience and salary required to Box No. 3308, THE AEROPLANE, 166, Piccadilly, W.1.

**Good General Machinists** wanted. No one already engaged on Government work or residing more than 10 miles away need apply.—Write, Z. G., 883, care of Deacon's, 7, Leadenhall Street, E.C.3.

**Wanted**, two experienced Spindle Hands; also woodworkers for aircraft work. Any person already engaged on Government work need not apply.—State experience, and wages required to nearest Employment Exchange, this paper and No. 0182.

**Good Spindle Machinists** wanted, used to aeroplane work preferred. No one already engaged on Government work or residing more than 10 miles away need apply.—Write, Z. F., 882, care of Deacon's, 7, Leadenhall Street, E.C.3.

**Wanted**, a good Charge hand for metal fittings shop at Weybridge. One who can read a drawing, an ordinary steel rule, and a micrometer, and keep good time. Wages about £5 per week, payable by the hour, for working 65 hours per week. Must be a 6 o'clock a.m. man, 6.15 a.m. or p.m. strongly objected to.—Box No. 3312, THE AEROPLANE, 166, Piccadilly, W.1.

**Wanted at once**, one hour from London, four aero-engine fitters to fit engine accessories. Good wages and conditions. No one on Government work need apply.—Applications must be made to nearest Employment Exchange, mentioning this paper and No. 3313.

## RADIATOR AND SHEET METAL WORK UNION WORKMEN (BEST RATES PAID) WANTED

Apply—  
**GALLAY RADIATOR CO., LTD.**  
198, Gt. Portland Street, W.3.

**Aeroplane Plane Assemblers and Aeroplane Fuselage Foremen** wanted. Good positions offered to suitable men. No person residing more than 10 miles away or already engaged on Government work need apply.—Apply Box 97, W. H. Smith and Son, Kingsway, London, W.C.2.

**Foreman** wanted for small branch works of well-known propeller company in London. State age, experience, and salary required. Permanency to suitable man. No one on Government work need apply.—Apply, in first instance, to nearest Labour Exchange, mentioning this paper and No. 3322.

**Sawmill Foreman or Charge Hand** wanted for mill at Hendon. Aircraft experience preferred. No person already on Government work or residing more than 10 miles away need apply.—The London and Provincial Aviation Co., Stag Lane Aerodrome, Edgware.

**Wanted Draughtsman** for detail aeroplane design. Must be good mathematician and capable of taking out own stress work.—Write, giving age, experience, and wages required, to nearest Employment Exchange, mentioning this paper and No. 3311. No one already engaged on Government work need apply.

**Building and Maintenance Foreman** for aeroplane factory in the North. Man with first-class all-round experience. No person already engaged on Government work will be engaged.—Apply, giving full particulars to your nearest Employment Exchange, mentioning this paper and No. 4429.

**Stores Cost and Records Clerk.**—Wanted by firm of aircraft builders, Southern district. Must be thoroughly efficient and methodical. Used to aircraft, engineering, or hardware trades. Stores routine. Six o'clock man. Ineligible for military service. One who knows his job and would render good service is required. No one on Government work need apply.—Write, with full particulars of experience, and state salary required to nearest Employment Exchange, mentioning this paper and No. 3310.

**First-class Enameller**, used to aircraft work, for aeroplane factory in the North. No person already engaged on Government work will be engaged.—Apply, giving full particulars, to your nearest Employment Exchange, mentioning this paper and No. A. 4432.

**First-class Foreman Millwright** wanted for aeroplane factory in the North, with all-round experience of erecting machines and boiler plant. No person already engaged on Government work will be engaged.—Apply, giving full particulars to your nearest Employment Exchange, mentioning this paper and No. A.4430.

**Foreman Tinsmith** for aeroplane factory in the North. No person already engaged on Government work will be engaged.—Apply, giving full particulars to your nearest Employment Exchange, mentioning this paper and No. A.4433.

**Erecting Superintendent** wanted for aeroplane factory in the North. Must be a first-class all-round man, with knowledge of all details. No person already engaged on Government work will be engaged.—Apply, giving full particulars, to your nearest Employment Exchange, mentioning this paper and No. A. 4431.

**Aeroplane Cabinetmakers, Coachbuilders, Piano Case Makers, Carpenters and Joiners**, with experience of aeroplane work, or men desirous of obtaining aeroplane work, required in Tottenham district. No person already engaged on Government work or residing more than 10 miles away need apply.—Apply by letter to Box 101, W. H. Smith and Son, Kingsway, W.C.2.

## SITUATIONS WANTED.

**Works Manager**, or position of trust, 37, practical engineer, invaluable experience both aeroplanes and seaplanes. Tactful, energetic, methodical organiser, accustomed to latest service methods and capable of economically increasing production.—Box 3284, THE AEROPLANE, 166, Piccadilly, W.1.

**Propellers, Works Foreman**, 33 years of age, desires position as foreman or manager. Used to control of men, practical, and good organiser. Excellent references.—Box 3317, THE AEROPLANE, 166, Piccadilly, W.1.

**Smart Business Woman** wants position with aeroplane firm, experienced D.E. bookkeeper, speaks French. Eight years' motor trade in Midlands. Disengaged. 55s.—B., 24, Adam Street, London, W.1.

**Works Manager** seeks position with progressive firm, or would take charge of production. Practical experience of seaplane and aeroplane sheet metal work and component parts. Good organiser. Tactful controller of labour. Well up in latest methods of production. Keen on increasing output. Capable of cutting down cost. Well recommended. Disengaged.—Reply, with full particulars, B. Smith, 98A, Kensington High Street, London, W.8.



# Clipper Time Recorders

## System "B."

The "IN" and "OUT" time is recorded on the card, also the time when jobs are changed.

The **TIME on the Job** is cast out at the side of card and the total hours entered in the Job No. column under the Job number.

**Unfinished Jobs** are entered at the foot with Job number and the total hours worked up to the week-end under column headed "Carried Forward," and transferred to the next week's time card in the column "Brought Forward," any time worked on this job during the second week is entered in the column, "Time for this Week." If the job is completed during the second week, the total is added and entered in the "Jobs Finished" column. If the job is not completed, the total is entered in the column "Carried Forward," which will in turn be entered on the third week's time card.

**STANDING ORDER NUMBERS** for constantly recurring Non-Productive Jobs are represented on the card, e.g. K.31 Grinding Tools; E.53 Making a New Lathe Tool.

CHECK No. 315.		WEEKLY TIME CARD. Week ending 18 Aug 1916 Name Tho. Johnson			
Job No.	IN-ON	OUT-OFF			
1360	5 59 SA 8 29 SA	12 01 S			5½
	5 59 M 8 29 M 1 29 Z	5 02 Z			9½
	5 59 TU 8 29 TU 1 29 Z	5 01 Z			9½
32 Hrs	5 59 W 8 29 W 1 29 Z				
		3 00 Z	32 hrs	7½	
1510	3 00 Z 6 00 TH 8 30 TH 1 29 Z	5 01 Z		2	9½
		5 00 Z	11½	9½	9½
K.31	6 00 M	7 00 F		1	
	7 00 F 8 29 F	10 00 F		2½	
E.53	10 00 F 1 30 M				
		4 00 M		5	
1820	4 00 M	5 00 M		1	9½
1469					
TOTAL FOR WEEK					53
Job No.	Brought Forward	This Week	Jobs Finished	Carried Forward	
1360	16	32	48		
1469				1	

### COMBINED "TIME AND JOB CARD"

For Recording COMPLETE LABOUR COST.

CATALOGUE FREE ON APPLICATION GIVING OTHER SYSTEMS.

## THE GLEDHILL-BROOK TIME RECORDERS LIMITED.

26, VICTORIA STREET, LONDON, S.W.

EMPIRE WORKS, HUDDERSFIELD.

44, HILL STREET, BIRMINGHAM.

Tel. Vict. 1310.

Tel. Mid. 2086.

Tel. 1069.



# WYCOMBE AIRCRAFT CONSTRUCTORS, LIMITED.

HIGH WYCOMBE,  
BUCKS.

Telephones : High Wycombe 84 (Stores : High Wycombe 120).  
Telegrams : "Aircraft, High Wycombe."

CONTRACTORS TO THE ADMIRALTY.

# SHORT BROTHERS, AEROPLANE WORKS, ROCHESTER, KENT, AND FLYING GROUNDS, EASTCHURCH, ISLE OF SHEPPEY.

Telephones :—

9, EASTCHURCH.  
627, CHATHAM.



Telegraphic Addresses :—

"FLIGHT, EASTCHURCH."  
"SEAPLANES, ROCHESTER."

EDITORIAL AND ADVERTISEMENT OFFICES, 166, PICCADILLY, W.1.

Printed for THE AEROPLANE AND GENERAL PUBLISHING CO., LTD., by BONNER & CO., The Chancery Lane Press, Rolls Passage, London, E.C.; and Published by THE WM. DAWSON PUBLISHING COMPANY, LTD., at Rolls House, Breems Buildings, London. Branches in Canada, Toronto, Montreal, and Winnipeg; in South Africa: Cape Town, Johannesburg, and Durban.



# THE AEROPLANE

WEDNESDAY, FEB. 6. 1918.

Edited by  
E. C. Grey

Vol. XIV. No. 6

THREEPENCE WEEKLY

[Registered at the G.P.O.  
as a Newspaper.]

## THE NORMAN THOMPSON FLIGHT CO. Ltd.

ESTABLISHED 1909

Telegrams—SOARING, BOGNOR  
ENTIFLYTE CHARLES, LONDON

Works—MIDDLETON, BOGNOR

CONTRACTORS TO THE ADMIRALTY

Telephones—BOGNOR 48. GERRARD 7385

London Office—  
DEWAR HOUSE, 11, HAYMARKET, S.W.1.

DESIGNERS AND MANUFACTURERS OF FLYING BOATS AND LAND PLANES

**Auster** FOR **Aero-shields**  
LONDON. BIRMINGHAM

**BEARDMORE** AERO  
ENGINES

**TITANINE**  
NON-POISONOUS  
**DOPE**  
SEE ADVERT. INSIDE.

**ACCLES & POLLOCK, LIMITED**

WELDLESS STEEL TUBES — OLDBURY, BIRMINGHAM.

**TRIPLEX** Safety **GLASS**  
See Advt. inside



# . THE . ENGINEERING TIMBER CO. Ltd.

11, Victoria Street, London, S.W.

J. E. HUSON, Managing Director.

Telephone: Victoria—1073, 4210

Telegrams: Entikosil, Vic. London.

SILVER SPRUCE

ASH

WEST VIRGINIAN SPRUCE

WALNUT

MAHOGANY

GLASGOW:

67, HOPE STREET.

Telephone: Central 3273.

Telegraphic Address: Entikosil, Glasgow.

PARIS AGENCY:

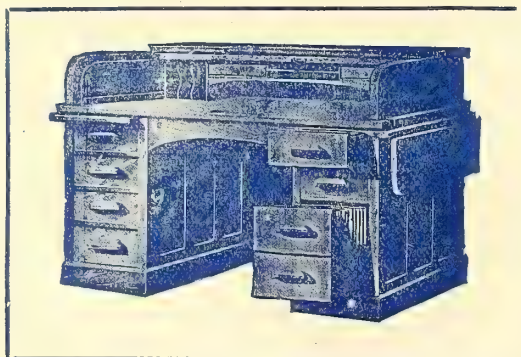
6, RUE DE HAVRE, PARIS.

## Factory & Office Furniture

LARGEST STOCK FOR IMMEDIATE DELIVERY.

(NEW AND SECOND-HAND)

SPECIALITÉ



SAFES.

## COOKE'S (FINSBURY) LTD.

INCORPORATING

The FINSBURY OFFICE  
FURNISHING Coy.

&


J. W. COOKE  
& Coy.

FINSBURY PAVEMENT HOUSE, LONDON, E.C.2.


Telephones: LONDON WALL } 6179.  
573.

See Telephone Book relating to our Shopfitting, Signs and other Departments.

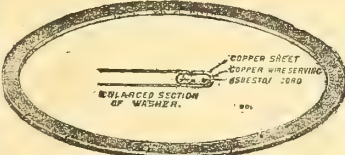




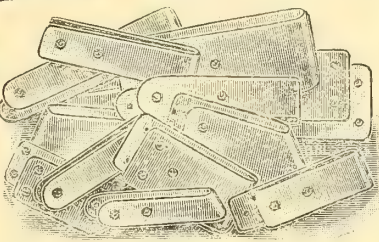
**Head Offices & Warehouses:**  
**GREAT EASTERN ST.,**  
**LONDON, E.C.2.**  
 BRANCHES AT MANCHESTER & PARIS.




6493      9065  
**HINGE PINS**  
 95s. per gross.  
 IMMEDIATE  
 DELIVERIES.



**C. & A. WASHERS** for Gnome  
 Engine Exhaust Valve Seat.  
 All types of C. & A. Washers supplied.  
**7m Rubber Covered Ignition Cable**  
 (Passed A.I.D.). SUPPLIED FROM STOCK.

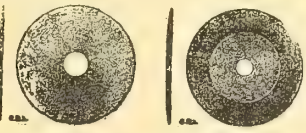


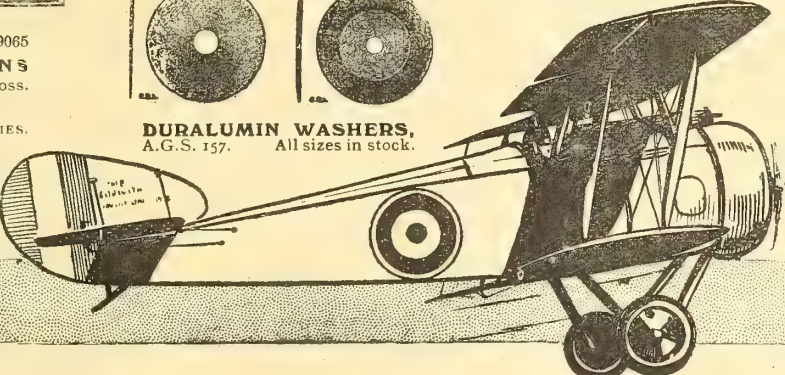
**ALUMINIUM CLIPS.**  
 All types supplied to Drawing.



**Fork Ends.**  
 11CSA/B.  
 10,000 pairs  
 from stock.

**DURALUMIN WASHERS,**  
 A.G.S. 157. All sizes in stock.





Send Three Stamps  
 for Portfolio of Illustrations of "Types of British Aircraft."

**The Sopwith Camel.**

**Types of British Aircraft**

**Metal  
 Fittings  
 a  
 Speciality.**

**The Aero Mechanical Co., Ltd.**

CONTRACTORS TO THE AIR BOARD.

60-66, ROCHESTER-ROW, LONDON, S.W.1.

Telephone:  
 Vic. 7570 (3 lines).

Managing Directors:  
 E. Salomon, J. Fogels

Complete Fittings  
 and Dies in Stock for  
 latest D.H. Machines;  
 also most of the Fittings  
 for other D.H. Machines  
 and Handley-Page.

**Our reputation has been built up by our ability to effect  
 deliveries right up to time.**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



Registered Trade Mark



Non-Inflammable Transparent Celluloid.

**LONDON LABEL CO., Ltd.,***Contractors to H.M. Government.***HARLEY WORKS, BECKTON RD., LONDON, E.**

**WIND SHIELDS  
MAP COVERS  
OBSERVATION PANELS**  
*Prompt deliveries of every type.*  
**LUMINOUS PRINTING**

Labels for Instrument boards, &amp;c., for night work.

Any special article made up to templates or drawings and delivered by return.

N.B.—Nonflamoid is very much lighter and easier to work than any kind of glass, also it will stand much harder usage.

**“NOVELLON” DOPE  
AND AEROPLANE VARNISH.  
CELLULOSE ACETATE & CHEMICALS**

**BRITISH CELLULOSE & CHEMICAL MANF'G.  
COMPANY, LIMITED.**

Telegrams:

Cellutate, London.

8, WATERLOO PLACE, S.W.1.

'Phone: Regent 4045.

Works: Spondon, Derby; and Maybury Gardens, High Road, Willesden Green, N.W.10.

(Telephone: Willesden 2380.)

**AIRSHIPS, LTD.**

**Manufacturers of Airships and Kite-Balloons**

**Contractors to the Admiralty**

London Office:

47, VICTORIA ST., S.W.

Works:

HIGH ST., MERTON, and HENDON

**THE AIRCRAFT CONSTRUCTION CO.**

EVERY DESCRIPTION OF METAL COMPONENTS.

**IMMEDIATE  
DELIVERY OF**

**SE5 SUMPS, part 11612-1**

**HARLEY AEROPLANE WORKS, Beckton Rd., E.16**

Telegrams: "Aercracons," Canning, London.

'Phone: East 1300.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



**BUY**  
**Your Streamline Wires**  
 FROM  
**THE ORIGINAL MAKERS**  
**BRUNTONS**  
**MUSSELBURGH,**  
**SCOTLAND.**

We can supply Wires, plain,  
 screwed or fitted with Fork or  
 Universal Joints.



**Alardux is the New Aluminium Flux**

**A Welding Flux of exceptional merit**

**May we send you a sample?**

**The Alardux Co.,**  
**23, Fleet Street,**  
**London, E.C.4.**

**City 866.**

**Rustless Fittings**  
**FOR AIRCRAFT.**

*We supply complete  
 Plants for Electro-  
 Zincing or Cold Gal-  
 vanising Aeroplane  
 Fittings by a process  
 approved by the  
 Government, also  
 complete Sherardi-  
 :: sing Plants. ::*

**The Rustless Iron (Cowper-Coles Process) Ltd.**

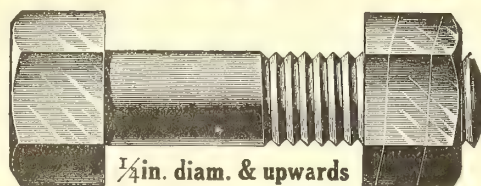
CONTRACTORS TO THE WAR OFFICE AND ADMIRALTY,

**1, French Street,**

**Sunbury-on-Thames, Middlesex.**

Tel: 37 SUNBURY.

**BRIGHT BOLTS & NUTS**



(Suitable for Every Description of Engineering Work)

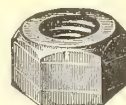
**QUALITY, ACCURACY AND FINISH GUARANTEED**

**THE**  
**"HELICOID" LOCK-NUT**

**(THE FINEST LOCK-NUT IN THE WORLD.)**

This nut will remain secure, no matter how great  
 the vibration may be—in fact vibration actually  
 tightens the grip.

(made from 1/4 in.  
 to 2 1/2 in.)



(sample nut & prices  
 on application)

**We also manufacture Wrought Iron Railing and Gates, etc.**

**BAYLISS, JONES & BAYLISS,**  
**LTD.**  
**WOLVERHAMPTON.**

**London Offices: 139/141, CANNON ST., E.C.4.**



THE  
**Eastbourne Aviation Co.**  
LTD.

ESTABLISHED 1911



**AEROPLANE CONSTRUCTORS**  
**Contractors to the Admiralty**



TELE { GRAMS: Aircraft } EASTBOURNE  
PHONE: 1176

**Bowden**  
**Wire Ltd.**



**LONDON**

BEING wholly engaged  
upon production for the  
British and Allied Governments,  
we regret that we are unable for  
the present to execute any orders  
for private purposes.

Victoria Road, Willesden Junction,  
N.W. 10.

Established 1897.

Godbolds

**LEARN TO FLY**

— AT —

**Bournemouth.**

— THE —

**LARGEST AND MOST UP-TO-DATE  
CIVILIAN SCHOOL IN ENGLAND.**

*Immediate Vacancies.*

*Run under Rules approved by the Royal Aero Club.*

**RAPID TUITION.**

43 Caudron Service Biplanes (Solo & Dual Control).

**SPECIAL TRAINING**

for Pupils intending to enter the R.F.C. or R.N.A.S.

**APPLY :**

**Bournemouth Aviation Co., Ltd.,**  
**AERODROME, BOURNEMOUTH. (Phone 1160).**

**TIMBER**

**SILVER SPRUCE**

**ENGLISH ASH**

**WALNUT & MAHOGANY**

.....

**JOSEPH OWEN & SONS**  
**Limited**

**Borough Saw Mills,**  
**LONDON, S.E.1.**

Telephone: Hop 38:1. Telegrams: "Bucheron Sedist."



# B·G·L

METAL COMPONENTS  
FOR  
AIRCRAFT

Exhausts for SE.5 and  
DeH.6 Tanks for Sopwith  
Scout DeH.9 & F2.A.

THE BIRMINGHAM GUILD LTD  
GT. CHARLES STREET, BIRMINGHAM.

## AIRCRAFT COMPONENTS

QUICK DELIVERY  
OF ALL  
DESCRIPTIONS OF  
AEROPLANE  
COMPONENTS.



METAL FITTINGS,  
ETC., ETC.

'PHONE: LONDON WALL 6725.

National Aircraft Mfg. Co.  
15, HACKNEY ROAD, LONDON, E.2

# Bowden, Tyseley.



for  
**BOWDEN  
CONTROLS**  
and  
**BOWDEN CABLES**  
for all  
**AEROPLANE  
PURPOSES.**

Quotations on application.

Note Address—

The BOWDEN BRAKE  
Co., Ltd., Tyseley,  
B'HAM.

R. H. G.

Contractors to H.M. Government.

## SWIFT AVIATION CO.

Dolphin Engine Plates in Stock,  
Complete Sets.

*Speciality Sopwith Spares.*

## KINGSTON

PHONE—  
762 KINGSTON

'GRAMS—  
"SWIFT, KINGSTON"



We make  
a  
Speciality  
of every  
Description

**NAME &  
ADDRESS PLATES**

IN IVORY · IVORINE · BRASS  
GERMAN SILVER · COPPER  
TABLETS For ALL PURPOSES  
*Prompt Delivery Guaranteed*  
**ENDOLITHIC MFG. & LTD**  
*6 1/2 Fore Street*  
LONDON E.C.

of Plates,  
Gauges and  
Dials for  
Aeroplanes,  
etc., etc.

Write for our "A" List.



**STEEL STAMPS**

OF EVERY DESCRIPTION.

Steel Letters and Figures, Stencil Plates,  
Branding Irons.

**JOHN MEERLOO & SONS,**

*Contractors to His Majesty's Government,*  
Cleveland Works, Cleveland Street, Mile End,  
London, E.1.

Phone:  
EAST 5551 (2 lines).

Telegrams:  
"Dayhur, Phone, London."



STEEL HAND PUNCH

**A.G.S. WASHERS**

Wire  
Work.

**THIMBLES**

Turn Buttons.  
Eyelets.  
Washers.

**UNION NUTS & NIPPLES.**

**W. H. BRISCOE & Co., Ltd.,**

51, 52, 53, PARK STREET,

**BIRMINGHAM.**

Tel.: 550 Central

Tel. Ad.: BRISK, BHAM.

**PLYWOOD**

In all Thicknesses and Qualities.

**SIBERIAN & GENERAL TRADING CO., Ltd.,**

1-3, Leonard Street, City Road, LONDON, E.C.2.

Telegraphic Address: "Wolosey, Finsquare, London." Telephone: London Wall 3577.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



**PROMPT DELIVERIES.**

Die and Sand Castings  
of any .. ..  
description.

**ALUMINIUM, MANGANESE-BRONZE,  
CLASS "A" METAL, BRASS, etc., etc.**

**THE ALBERTA  
ENGINEERING CO., LTD..**

**2, Princes Road,  
RICHMOND (Surrey).**

Telephone: RICHMOND 352.

Telegrams: ALBERTA ENGINEERING, RICHMOND.

**Urgent Requirements.****MATERIAL WANTED.**

Offers required for the following:—

PLYWOOD,  $\frac{1}{8}$ ",  $\frac{3}{16}$ ",  $\frac{1}{4}$ ",  $\frac{5}{16}$ ",  $\frac{3}{8}$ ",  $\frac{1}{2}$ ",  $\frac{5}{8}$ "

ALL TYPES OF METAL FITTINGS,

ALUMINIUM DIE CASTINGS,

and HOT BRASS STAMPINGS

for AVRO 504 J Biplanes.



**THE GRAHAME-WHITE AVIATION CO., LTD..**  
**AERONAUTICAL ENGINEERS.**

**NOTICE**

**To DeH.6. Contractors.**

We can supply *ex* STOCK  
BLANKINGS for all Metal Parts  
and AXLES complete.

*Special developments of the following:—*

Parts Nos. 9485 } Three blankings per set.  
" " 9488 }

Telephone:—Kingsbury 120 (5 lines).

Telegrams:—Volplane, Hyde, London.

**THE LONDON AERODROME, HENDON, N.W.9**

Proprietors of the London Aerodrome and the Grahame-White School of Flying.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





NOTHING BETTER

THE PIONEER OF THE TRACTOR BIPLANE—  
THE UNIVERSALLY ADOPTED TYPE

A. V. ROE & Co. Ltd.,

Telegrams :  
"TRIPLANE."

MANCHESTER

Telephone :  
City 8530 and 8531.



"It's comin' yet, for a' that!"



WAR.

Our 'Huge Plant working day and night turning  
out Aero Engines to win the War, but—

PEACE.

The Dawn of Peace will see the production of a  
car which will be the embodiment of all that is  
latest and greatest in the Motor Car World.

Are you on the Waiting List?

*Arrol-Johnston*  
Ltd.  
DUMFRIES.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# The AEROPLANE

The Editorial and Advertising Offices of "The Aeroplane" are at 166, Piccadilly, London W.1.  
 Telegraphic Address: "Aileron, London." Telephone: Mayfair, 5407.  
 Accounts, and all correspondence relating thereto, should be sent to the Registered Offices of  
 The Aeroplane and General Publishing Co., Ltd., Rolls House, Breams Buildings, E.C.4.  
 Subscription Rates, post free: Home, 3 months, 9s. 10d. 6 months, 7s. 7d.; 12 months, 15s. 2d.  
 Foreign, 3 months, 6s. 0d.; 6 months, 10s. 0d.; 12 months, 20s. 0d. Canada, 1 Year, \$4.70c.  
 U.S.A. 1 Year, \$5.20c.

## ON THE BRITISH AIRCRAFT INDUSTRY IN 1917.

It may be stated without fear of controversion that in no branch of war activity has greater development taken place during the past year than in the British Aircraft Industry.

In 1914 the Industry consisted of a few sporting individuals and aeronautical enthusiasts who had staked all their own money, and in some cases all they could borrow from their friends and relations, on their faith in flying. Most of them were on the verge of bankruptcy, owing to lack of official support, and some of the pioneers had actually been forced to retire from the business altogether.

In 1915 the Government began to awake to the need for aeroplanes and engines, and the starving remnant of what might have been a thriving industry—as it was in Germany—responded pluckily to the country's call. Like the British Army in France, the Industry was mis-handled in matters of matériel, and men and time were wasted by incompetent officials. Also, to make matters worse, the High Command of the R.F.C. was obsessed by the idea that no aeroplane or engine could be of serious worth unless it had been designed by official experts. Consequently aeroplanes of new type which might have been of the highest value on active service were continually turned down and rejected because the official experts were always on the point of producing something which they promised would be better. As in the famous case of Alice, with her "jam yesterday and jam to-morrow, but never jam to-day," those wonderful machines of to-morrow never appeared till yesterday. So, towards the end of the year it began to dawn on those in authority that perhaps after all the despised "trade" might do better if given a fair chance, and encouraged to produce something of its own. And thus the Aircraft Industry began to show signs of real development.

### THE SOCIETY OF BRITISH AIRCRAFT CONSTRUCTORS.

At the beginning of 1916, certain members of the Aircraft Industry arrived at the conclusion that the time had come for the formation of a society which would be qualified to represent the Industry as a whole, so a meeting of the heads of the aircraft firms was called. The conveners of the meeting were Mr. R. O. Cary, of the Sopwith Co.; Mr. H. White Smith, of the Bristol Co.; Mr. G. Holt Thomas, of the Aircraft Mfg. Co.; Major H. F. Wood, of Vickers, Ltd.; and Mr. T. Howard Wright, of J. S. White & Co. These five gentlemen, all of whom were among the pioneers of British aviation, will go down to history as the founders of the S.B.A.C., a society which should in due time become one of the most powerful engineering organisations in the world.

The meeting, which was thoroughly representative of the Industry, decided to form a trade association, for which the name chosen was the Society of British Aircraft Constructors. Thenceforward the history of the

Aircraft Industry is to all intents and purposes the history of the S.B.A.C.

### EARLY HISTORY.

The S.B.A.C. actually came into being in March, 1916, and so was formed a little while before the appointment of the first Air Board. This interesting fact appears to indicate that the British Aircraft Industry perceived the benefits to be derived from cohesion, collaboration, and co-operation some time before the same idea penetrated into official cerebella.

During 1916 the S.B.A.C. established itself on a firm footing, and most of the year was occupied in the work of organising the Industry, not merely in its own financial interests, but in the true interests of the Flying Services, and in the interests of the ultimate development of British aviation. The result was that by the end of the year the S.B.A.C. had become what one may perhaps claim to be the most representative body in any industry. All the pioneer designing firms of the Industry had joined, and were well represented on the Council of the Society. Practically all the responsible firms in other industries which had taken up the making of aircraft as a war occupation had also come in. The great manufacturers of raw material, such as the Sheffield steel makers, whose reputation is world-wide, joined also, not merely as a matter of form, but as very active participants in the activities of the Society.

### A SOUND BASIS.

The list of members, as published at the beginning of 1917, gave one an impression of the solidity and stability of the organisation, and the list of names on the Committee of Management confirmed this impression, containing, as it did, an eminently fair admixture of essentially aircraft firms and of engineering firms who had taken up aircraft work.

The Chairman of the Society, Mr. H. White Smith, who was the first chairman in 1916 and is re-elected for the third time for 1918, has constantly proved his eminent suitability for his responsible position, and has held the balance fairly between the various sections on all occasions; though, be it said, there has been singular freedom from the tendency to split up into factions which is so frequent a source of weakness in trade and industrial societies which include different categories of members.

One of the first acts of the Council, in 1916, was to form a special section for manufacturers of aero-engines, and Mr. Neville Gwynne, of Gwynne's, Ltd., was elected and has remained chairman of this section. In this position he has been as successful as has Mr. White Smith in the Chairmanship of the Society. Both are business men of experience and ability, both have the gift of foresight, with the quality of not permitting their enthusiasm to outrun their dis-



cretion. And to them may be ascribed much of the success achieved by the Society, both in its internal affairs and in the weight which it carries in official circles.

#### A VALUABLE ALLIANCE.

One of the last acts of the Society in 1916 was to form a working alliance with the Aeronautical Society of Great Britain. This is the premier scientific aeronautical body of the world, having been founded in 1860, and it did much valuable work long before any man ever flew, but, being purely scientific, it failed to obtain the support which it deserved. However, the alliance with the S.B.A.C. gave it an entirely new lease of life, and brought into it the bright young brains of the men in the Aircraft Industry who had placed British aeroplane design in front of that in any other country.

Incidentally it is important to note that the Aeronautical Society must not be confused with a concern which has assumed the title "The Aeronautical Institute," as the latter has no connection with the S.B.A.C., the Royal Aero Club, or any other official or semi-official organisation. The Aeronautical Society, on the other hand, is closely allied with the other established aeronautical organisations, and certain of its sectional committees are definitely constituted Government committees.

By the agreement between the S.B.A.C. and the Aeronautical Society the respective spheres of influence of the two bodies was definitely defined, and valuable educational work by the Aeronautical Society was made possible, thanks to the financial stability acquired by the influx of members from the S.B.A.C. One hopes, at an early date, to be able to give a review of the work of the Aeronautical Society since its revival at the beginning of 1917. Meantime it must suffice to say that under the able chairmanship of General Ruck, and thanks to the capable secretarial work of Mr. W. Barnard Faraday, the Society has done work of high value to the Services and the Industry during 1917.

#### THE INDEPENDENCE OF THE AIRCRAFT INDUSTRY.

At one period during the early days of the S.B.A.C. an attempt was made by the Motor Trade to take the Aircraft Industry under its protecting wing. Doubtless the addition of the many new aircraft firms would have been an excellent thing for the Society of Motor Manufacturers and Traders, but the aircraft firms were not so sure that it would be equally excellent for the development of British aeronautics.

If one may judge by the lamentable lack of development in aeronautics in the United States, where aircraft and aero-engine construction has apparently fallen absolutely into the hands of the motor-monger, it seems well that the Aircraft Industry maintained its independence in this country. A trade in which business methods, ideas of design, and systems of manufacture have become stereotyped by long years of purely commercial prosperity, regardless of scientific progress, is the last thing in the world fit to act as a foster-mother to a new industry which, if it is to progress at all, must do so by defying conventions of design, accepted commercial methods, and those imaginary scientific laws which have only come to be regarded as laws because they are laid down by people whose names are bigger than their imaginations and performances.

Anyhow, the Aircraft Industry happily decided to be its own master, and the wisdom of its choice is shown by its startling progress during 1917. Incidentally it is worthy of note that such members of the S.B.A.C. as were essentially motor manufacturers before entering the Aircraft Industry—that is to say, those who are originators of ideas and not merely reproducers of the designs of others—are among the keenest supporters

of the independence of the Aircraft Industry, and that, furthermore, many of them were notable for the originality of their own designs in car engines. Such members of the Motor Trade have been a very valuable acquisition to the S.B.A.C.

To-day, apparently, the various Motor Trade organisations readily admit the independence and the distinctive aims of the Aircraft Industry. Which only shows that nothing succeeds like success. The Committee of the S.B.A.C. took up a strong position on this question of independence when the subject first became of importance, and it has had its way.

The Society is fortunate in that whenever trouble appears on the horizon the Committee always looks for the sensible way of meeting that trouble, and decides on a quiet and dignified but firm line of action which, so far at any rate, has invariably had the desired effect.

#### THE S.B.A.C. IN 1917.

The activities of the S.B.A.C. in 1917 have extended very considerably, in accord with its increased membership. Probably it would not be advisable to mention the precise number of firms now included in the Society, but one may indicate its increased strength by stating that the membership was quite strong numerically as well as influentially and financially when it was first formed. Its membership almost doubled in numbers by the end of 1916, and had practically trebled by the end of 1917. Both in numbers and in the amount of capital represented by its members the Society is worthy of ranking with the leading federations of employers in the country.

Mention of such federation makes it apposite to mention that the S.B.A.C. has wisely decided not to handle labour questions on its own account, presumably because so many different Trade Unions are represented among the employees in aircraft works. It has therefore allied itself with the Engineering Employers' Federation, which includes all the great engineering industries, and all questions of labour are handled by this Federation.

Nevertheless the S.B.A.C. watches very closely all matters affecting labour, and, in the interests of its members, collects and collates information concerning wages, piece-work prices, conditions of employment, and so forth, and acts generally as a clearing-house for all matters concerning the efficiency and welfare of the Industry. In this capacity it issues to its members a monthly report of the Society's doings, of the subjects brought before the Committee of Management, of new Government Regulations affecting the Aircraft Industry, and of any other matters affecting the output of aircraft.

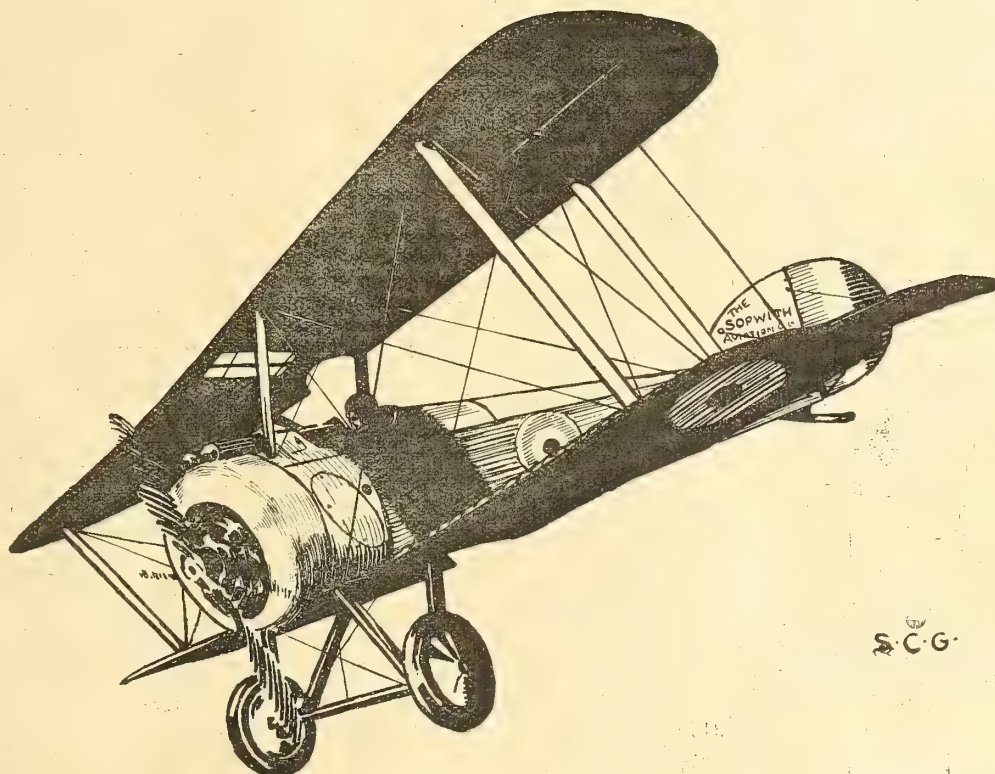
#### ASSISTING THE SERVICES.

Apart from looking after the welfare of the Industry, the S.B.A.C. has been constantly of direct help to the Services. During the past year the Council has had a number of meetings with the Air Board, in order to give direct information as to the capacity or ability of the aircraft constructors. These meetings have been chiefly concerned with questions of supply, matters affecting contracts, and technical subjects. The Committee of Management is fully qualified to speak for the whole Industry on all such points, comprising as it does some of the best business men, manufacturers, and designers concerned with aircraft.

On the invitation of the S.B.A.C., the Engineering Standards Committee, an official organisation, has appointed a Sectional Committee to deal with the standardisation of aircraft and aero-engine parts. The Controller of the Technical Department of the Air Ministry is, *ipso facto*, chairman of this Sectional Committee, on which various Government Departments and the S.B.A.C. are represented. A number of sub-committees have been appointed to deal with specific questions



# THE SOPWITH



**AVIATION COMPANY, LIMITED**  
**KINGSTON-ON-THAMES, ENGLAND.**  
**CONTRACTORS TO H.M. GOVERNMENT.**

Telephone: KINGSTON 1988 (8 lines).  
Telegrams: SOPWITH, KINGSTON:



Paris Office:  
21, RUE DU MONT THABOR.



affecting the subject of standardisation, and on these the Society is also strongly in evidence.

#### EXCESS PROFITS.

Among its multifarious commercial and technical activities the Committee manages to watch all legislation affecting the Industry. In particular it is to be recorded that negotiations have been undertaken with the Inland Revenue authorities on the question of excess profit duties.

The matter of excess profits is somewhat difficult where the Aircraft Industry is concerned. Practically none of the pioneer aircraft firms, the designers of all the useful aeroplanes, made any profits before the war. As already explained, most of them were on the verge of bankruptcy when war broke out. Some had sunk tens of thousands of pounds in experimental work, without any return. One, it is rumoured, managed to show a profit of some £20 or £30 by selling a machine to Germany because the British Government did not want it. Anyhow, none had any pre-war standard of profit on which to base war-profits.

Unfortunately capital sunk in experiments, which any ordinary auditor would put into the balance-sheet as "good-will" and class as a capital asset, does not appear to be regarded by Government auditors as capital. It seems that the only capital recognised by officialdom is the amount represented by the excess of assets over liabilities, and on this amount alone is the meagre interest permitted by law allowed to be estimated. The assets of most aeroplane firms at the outbreak of war consisted of one or more aeroplanes which resembled the famous automobile of Messrs. Potash and Perlmutter, in that they were rather liabilities than assets. Consequently the difficulty of establishing a pre-war basis is evident, and it would seem that the pioneer firms, to whose pre-war enterprise the British Empire owes the position which the British Flying Services hold in the war to-day, are entitled to a very small fraction of their belated profits.

On the other hand, there are many firms making aeroplanes to-day who made enormous profits out of quite other goods before the war, and whose businesses would either have collapsed altogether if they had not entered the Aircraft Industry, or would have made much smaller profits out of some other branch of munition work. Those firms are allowed by law to make all their pre-war profits, plus an extra 10 per cent.—that one believes is the figure—and after that they are allowed to keep a

fifth of what remains of the profits afterwards. And they are making those increased profits out of aeroplanes built to the designs of the pioneer firms which are practically not allowed to make any profit at all worth mentioning.

The position would be distinctly humorous if it were not so obviously unfair. Precisely what arrangements the S.B.A.C. has made with the Inland Revenue authorities to put the whole question on an equitable basis has not been revealed, but one gathers that, at any rate, the aircraft firms in general are likely to receive considerably better treatment than would have been the case if no combined action had been taken in the matter.

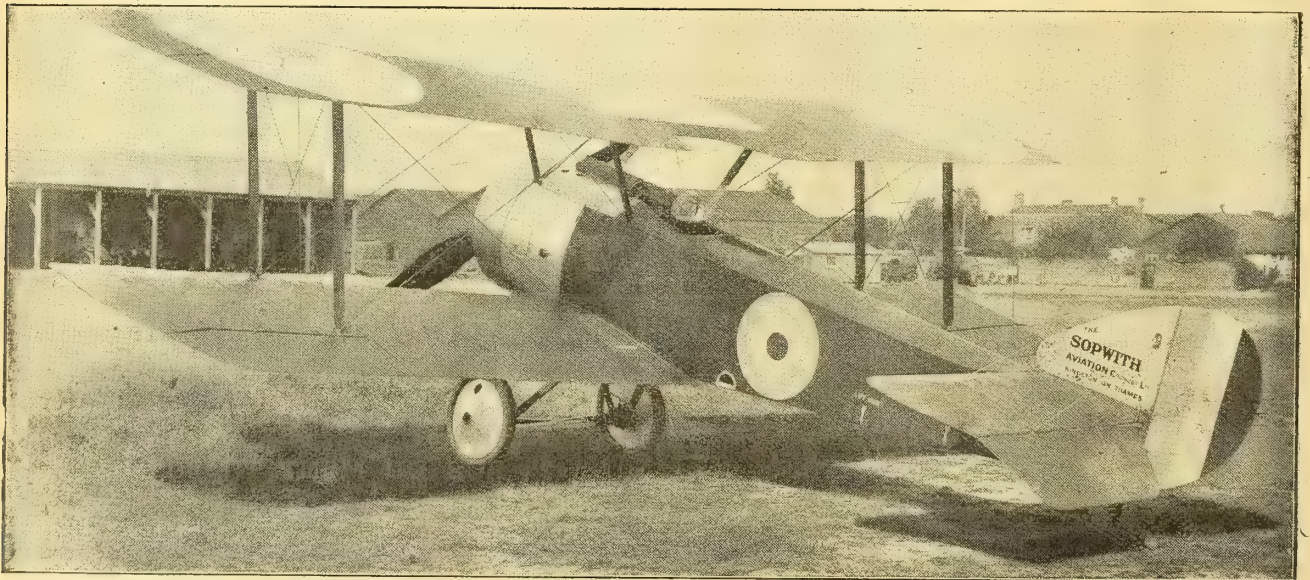
#### THE FUTURE WELFARE OF THE INDUSTRY.

Amid all its present-day work the Committee finds time to watch the future, and questions of trade after the war—or perhaps one may say the possibilities of absence of trade after the war—are having close attention. It will be remembered that the S.B.A.C. is strongly and ably represented on the Civil Aerial Transport Committee, which has been appointed to study the uses of aircraft when war ceases to be the national industry, and to make recommendations to whatever Government may afflict us meanwhile as to how to prevent the Aircraft Industry from dispersing itself into less essential branches of commerce. Here, as elsewhere, the interests of the Industry are in very capable hands, and whatever may be the outcome of the Civil Aerial Transport Committee it will be certain that the S.B.A.C. representatives have done their best for the future welfare of the Industry.

#### GENEROSITY.

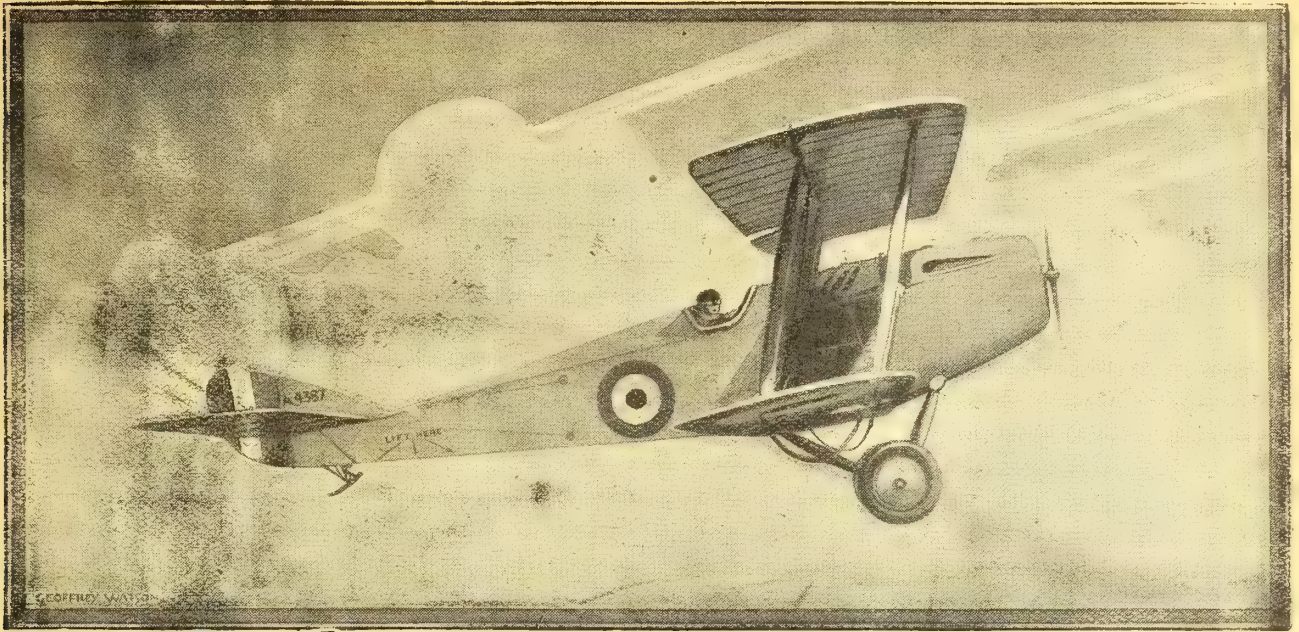
It has been well said that charity begins at home. Evidently the S.B.A.C. believes in that principle firmly, for its members have been more than generous in their donations to aeronautical charities. In the winter of 1916-17, the members collected among themselves the handsome sum of £7,000, which was divided equally between the R.N.A.S. Comforts Fund, founded by Mrs. Sueter, and the R.F.C. Aid Committee, of which Lady Henderson is the head.

The same amount has again been collected and divided between the two funds, to help the men of the Flying Services through the winter of 1917-18, and doubtless the Industry will be equally generous in succeeding winters. One ventures to suggest that the members of the S.B.A.C. will come down more handsomely still

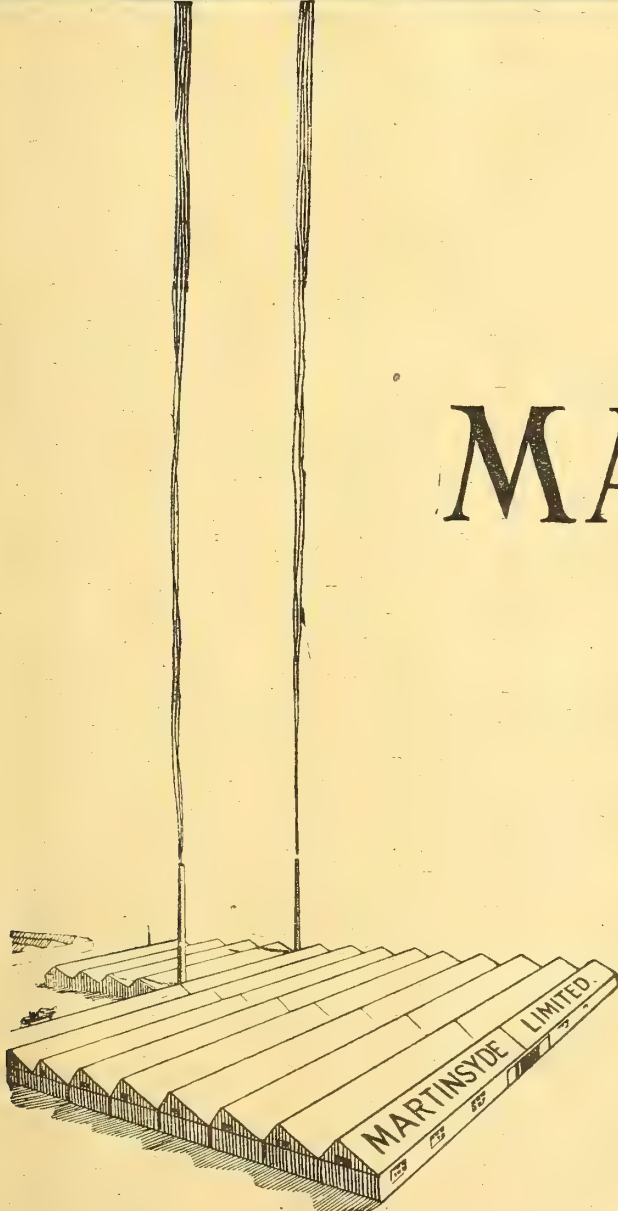


The Sopwith "Pup," with 80h.p. Gnôme or Le Rhône Engine. One of the most successful Fighting Machines of 1916-17. A direct successor of the famous Sopwith "Tabloid" of 1913.





# MARTINSYDE



Aerodrome - and  
Auxiliary Works:  
BROOKLANDS.

Head Office  
& Works:  
WOKING, Surrey.





when the said funds reach their Jubilee War Winter, or perhaps it may be on the occasion of their Silver Wedding, seeing that when there is only one Air Force the two funds will probably find it advisable to join forces. That is, of course, provided that the Industry has not become bankrupt through having to pay an excess profit duty of 150 per cent., at the rate of 40s. in the £1, or some such vagary of high finance.

#### THE INTERDEPENDENCE OF THE SERVICES AND THE INDUSTRY.

In all seriousness, though, the generosity of the members of the S.B.A.C. is direct evidence of the close touch between the Services and the Industry. It is a distinct recognition of the fact that in no other industry are there such intimate relations between the manufacturer of war material and the users thereof.

The mutual interdependence of the Flying Services and the Industry is a fact which is not perhaps fully recognised. Without the pluck and skill of the pilots and the organising ability of the officers at home and abroad, the Industry would be less well supplied with orders.

Perhaps, indeed, the Industry should feel grateful to some of those who in the past have not been conspicuous for their organising ability or their skill as pilots, for if the organisation had been better there would have been less waste of material, better machines and engines would have been ordered, and the same amount of air work at the front and at sea might have been done with fewer machines. Also if the skill of pilots and instructors had been greater, and if the system of training had been better, there would have been fewer crashed aeroplanes, which also would have meant a diminution of orders. However, one hopes that all these errors are things of the past, and, anyhow, it is an ill wind which blows nobody any good.

On the other side of the picture, it is evident that if the pioneer firms of the Industry had not struggled so gamely against adversity the active service pilots would not have the excellent machines on which they are now mounted; and that if the newcomers to the Industry had not taken their work so seriously, and had not carried it out so sincerely, the quality and quantity of those machines would be very much worse than it is to-day.

#### THE DEBT TO THE PIONEERS.

Perhaps one of the most striking features of the Industry's progress in 1917 is the continued pre-eminence of the pioneers in designing new types. The enemy knows to his cost and the R.F.C. knows to its joy that the best machines of the year have been those of the earliest designers. The Sopwith "Pups" and "Camels," the de Havilland reconnaissance machines, the Martinsyde "Elephants," the Barnwell-Bristol fighters, and the S.E.s, which still show traces of early de Havilland influence, are all the products of men who went through the mill in the lean days before the war. In the Training Division the Avro is pre-eminent, and the Armstrong-Whitworth, originally designed by Mr. Koolhoven, formerly of the deceased Deperdussin Company, holds its place, as do Captain de Havilland's early efforts in B.E.s and R.E.s. And one gathers that Mr. Koolhoven's name is likely to be considerably more prominent in future.

On the sea-going side the Short seaplanes, the Fairey seaplanes, and the Porte flying-boats have all been designed by pioneers of the Aircraft Industry. Therefore, taking it all round, one perceives that the Services in the air, afloat and on land owe a distinct debt of gratitude to those who by sheer pluck survived pre-war neglect, and have now given to this country the world's best aeroplanes.

#### TO BE FILED FOR REFERENCE.

As a matter of historic interest it seems right to put on record the names of the Committee of Management of the S.B.A.C. for 1917-18.

The Chairman, as already noted, is Mr. H. White Smith, of the British and Colonial Aeroplane Co., Ltd. The members of Committee are: Sir Herbert Austin, the Austin Motor Co., Ltd.; Mr. R. O. Cary, the Sopwith Aviation Co., Ltd.; Mr. L. Coatalen, the Sunbeam Motor Car Co., Ltd.; Captain I. F. Fairbairn-Crawford, Sir W. G. Armstrong, Whitworth and Co., Ltd.; Mr. Hamilton Fulton, Martinsyde, Ltd.; Mr. N. G. Gwynne, Gwynne's, Ltd. (who is also chairman of the Aircraft Engine Section); Mr. F. Handley Page, Handley Page, Ltd.; Mr. E. B. Parker, Short Brothers; Mr. E. W. Petter, Westland Aircraft Works (Pettors, Ltd.); Mr. J. D. Siddeley, the Siddeley-Deasy Motor Car Co., Ltd.; Mr. G. Holt Thomas, the Aircraft Manufacturing Co., Ltd.; Mr. H. T. Vane, D. Napier and Son, Ltd.; and Major H. F. Wood, Vickers, Ltd.

There you have as representative a body as anyone could wish. Pioneer designing firms, big engineering firms, newcomers, engine firms, and seaplane firms are all fairly represented by men on whom each section can rely.

During 1917 the S.B.A.C. moved into new offices at 1, Albemarle Street, W.1, at the corner of Piccadilly, an excellent position, right in the centre of that district where people aviate most do congregate, close to the Royal Aero Club and to the new premises of the Aeronautical Society, not to mention being within hailing distance of the offices of this paper—though naturally one would not be guilty of hailing a friend across Piccadilly, even in these days of the ban on motor traffic.

#### THE SECRETARIAT.

No account of the S.B.A.C. and its activities would be complete without a tribute to the valuable work of the Secretary, Mr. Charles V. Allen. If one remembers aright, Mr. Allen undertook the duties of Secretary *pro tem.* when the Society was first formed, but, whether that recollection is correct or not, he is now a recognised institution in the Aircraft Industry. His energy and his capacity for continued hard work have conquered the difficult task of doing routine work and continually starting out on new lines of activity at the same time, so that despite the numerous directions in which the Society operates, its secretarial work is always done promptly. Those who have to carry on business correspondence in these days will appreciate what it means to keep level with one's work in this respect.

Likewise, his grasp of ideas and his quick perception have enabled him, though new to aircraft problems in 1916, to acquire in less than two years a knowledge of the inside working of the new Industry which is unsurpassed even by the oldest hands. Consequently the Society's business is conducted in a manner which cannot but afford satisfaction to the members, and must thus react to the welfare of the Industry as a whole. One takes the liberty of congratulating the Society on its Secretary and the Secretary on the Society.

#### AIMS AND OBJECTS.

Finally, it seems well to place on record the aims and objects of the Society, lest there should in future be any doubts thereon. It is set forth in the Memorandum of Association that the Society has power:

(a) To afford advice to its members generally on matters affecting the Industry.

(b) To give to the Legislature, public bodies, and others facilities for ascertaining the views of the members of the Society as regards matters affecting the Industry.



# MANNECERTON & Co.Ltd.

CONTRACTORS TO THE ADMIRALTY  
AND H.M. WAR OFFICE.

## Designers and Manufacturers of Proved Efficiency of all Types of AIRCRAFT

HEAD OFFICE AND WORKS

### AIRCRAFT WORKS, NORWICH

---

#### SPECIAL DEPARTMENT

for the manufacture of

#### AIRCRAFT ACCESSORIES

(Strainers, Bolts and Nuts, etc., etc.)

177, CLEVELAND ST., LONDON, W.1.

# MANNECERTON & Co.Ltd.

LONDON

NORWICH

IPSWICH

BURY ST. EDMUNDS.



- (c) To act as the representative of all or any members in matters affecting the Industry.
- (d) To collect statistics and other information.
- (e) To endeavour to obtain special advantages for the general body of its members.
- (f) To conduct exhibitions, competitions, *et cetera*.
- (g) To promote the adoption of equitable forms of contracts and other documents used in the Industry.
- (h) To undertake or assist in litigation affecting the interests of the Industry.

Thus it may be seen that the Aircraft Industry has in the S.B.A.C. at once a champion and a father-confessor, so that its interests are adequately guarded. One looks forward with keen interest to the Society's first aircraft exhibition after the war, for one feels that this will show the world that we have in this country an Industry worthy of our Flying Services and a controlling Society worthy of the Industry.

It is interesting to note that members must be British, both as regards the place of manufacture of their goods and the finance and control of their business.

There are two classes of members, namely, ordinary members, who must be either aircraft constructors or aero engine constructors, and associate members, who must be manufacturers of or traders in aircraft or aero

### ANOTHER INSULT TO THE SERVICES.

Mr. Macpherson, Under Secretary for War, told the House of Commons last week that the two officers who brought down a raiding aeroplane on Monday night were Capt. G. H. Hackwell, R.F.C., and Sec. Lt. C. C. Bankes, R.F.C.

He stated that approximately only ten enemy machines came inland on Monday—the official account puts the number at fifteen—and that only four or five passed over London.

While one is glad to have Mr. Macpherson's figures one fails to see any reason for publishing the names of the officers until such time as they appear in the usual list of awards, along with those of others who have achieved acts of similar gallantry. Still less does one see any reason for publishing officially the photographs of the officers in question. It is, however, satisfactory to notice that the published photographs indicate clearly that these officers were "snap-shotted" against their inclination.

It is to be hoped that this pandering to the demands of the press on the part of the new Air Council does not presage a publicity campaign by the Air Force, similar to that in which other Government departments have indulged in the past. We have had more than enough of the kind of bathos which produced posters of the "What did you do in the Great War, Daddy?" and "Buy little Willie a Tank Bond and put it in His Stocking for Christmas," species.

The Non-Conformist Conscience, which forbids the working-man to have a sporting gamble on Premium Bonds and yet allots human food to race-horses so that Non-Conformist papers can continue their betting news, has shown itself capable of turning Whistler's sacred picture of his mother into a War Loan poster of the most drivelling kind, so it may well publish a series of pictures of "Heroes of the Air," with character sketches and descriptions of their "Deeds of Derring-Do," by our old friend "Air Pilot," or some similar hot-air merchant. If this sort of thing is to be done then let us go the whole hog and produce as the frontispiece of such a book a photograph of the coffin of a deceased aviator, with a selection of War Loan posters stuck along the sides, as an incentive to the well-paid working-man to make or buy more aeroplanes for the benefit of the comrades of the dead hero.

Just what the Air Force or the British public gains by publishing the names and photographs of officers who have done their duty is impossible to understand. If the names had been Smith and Jones everyone would have been just as wise, and certainly none will ever recognise the officers from their photographs, which must be a great consolation to the victims. As was pointed out recently, there are grave military objections to publishing the names of "star-turns," either at home or abroad. If one wants a further example one need only quote the case of young Mr. Robinson, who brought down a Schütte-Lanz airship in England, and was boomed by our fatuous press as "the conqueror of the Zeppelin." The result was that on going to France for the first time he endeavoured gallantly to live up to his reputation and his V.C. ribbon, without experience of Hun-fighting over the lines, and finished up his effort as a prisoner in Germany.

Though Lord Rothermere is himself a newspaper proprietor one cannot believe that he sanctioned this further outbreak of advertisement. In fact, being so much behind the scenes in Fleet

engine parts, accessories, or material, or engaged in ancillary and allied businesses.

All will agree cordially with the Society's own statement that "the co-ordination effected through the Society is undoubtedly of distinct importance in the development of the British Aeronautical Industry."—As one has said at the beginning of this article the S.B.A.C. is the Aircraft Industry. The history of the Society during 1917 is one of which it may well be proud.

Journalists, inspired apparently by people who possibly have reasons of their own for being hostile to the S.B.A.C., have written of an alleged "ring," which they say has been formed to keep up the prices of aircraft, and presumably for other noxious purposes. Knowing the Industry fairly well, having been intimately in touch with it since 1908, one has no hesitation in describing these allegations as common lies. The only aircraft ring which exists is the S.B.A.C., and it exists for the good of the Aircraft Industry as a whole, which means, to any man of intelligence who looks at the names of the Committee, a clean business deal all round, and a patriotic endeavour to give to the Flying Services the best aeroplanes in the world. The history of the Services in 1917 shows that in that year the Industry has succeeded in its endeavour.—C. G. G.

Street, it must be impossible for him to have any illusions as to the real use of this form of publicity. It is still more impossible that the Chief of the Air Staff gave his consent to it, and therefore it can only have happened through the influence of some more than usually banal politician in high position. It is earnestly to be hoped that the influence of the Regular Army in the Air Council will be sufficiently strong in future to forbid definitely any further such exhibitions.—C. G. G.

### THE AIR COUNCIL.

The Secretary of State for the Air Force has appointed the Right Hon. Sir Henry Norman, Bt., M.F., to be an additional member of the Air Council. The reason is not explained.

### THE IMPERIAL WAR EXHIBITION.

The Imperial War Exhibition, which is being held under the auspices of the official Imperial War Museum at the Royal Academy, Burlington House, Piccadilly, W., has received as an exhibit the remains of the Gotha which was brought down in Essex during the air raid on Jan. 28th. The parts have been lent by the Air Ministry, and include wing, engine, machine-guns, etc.

### AUTOMATIC DESTRUCTION.

The following paragraph from the "Daily Chronicle" of Feb. 5th is of considerable interest:—

"The aeroplane used by the two German barons who were brought down in Paris was probably not of the latest type, or they would not have had to fire incendiary bullets into their disabled machine. The newest German model possesses something simpler and less dangerous. If its crew survive a crash, the pilot switches on an electric clockwork apparatus. At the end of three minutes a break in the current causes a spark which detonates a charge and drives a Very light into the petrol tank. But in the three minutes the crew have betaken themselves to safety."

### SPEED.

A lecture on "Speed" is to be delivered at the Women's Institute, 92, Victoria Street, S.W.1., on Feb. 15th, at 3 o'clock. The lecturer is to be Lt.-Col. Mervyn O'Gorman, C.B., and the lecture will be particularly illustrated by examples of aircraft speed. As has frequently been pointed out in this paper, Col. O'Gorman is at once one of the most entertaining and instructive lecturers who has ever spoken on the subject of aircraft, and one strongly recommends all readers who are interested in the subject of speed to attend this lecture if their business engagements permit. The room is not very large, and therefore applications for tickets should be made as early as possible to the Secretary of the Women's Institute at the address given above.

### A CORRECTION.

Owing to an unforgivable printer's error in a notice which appeared in THE AEROPLANE for Jan. 30th concerning the Gosport Aircraft Company, Mr. Charles Nicholson, who is associated with Sir Charles C. Allom in this Company, is spoken of as senior partner of the firm of Cowper & Nicholson, the famous yacht builders. It will be obvious to all yachting people that the line should have read Camper & Nicholson, and the correction is hereby recorded.



# S. E. SAUNDERS

LIMITED  
Est. 1850

DESIGNERS & CONSTRUCTORS  
OF AIR AND MARINE  
CRAFT



Head Office and Productive Works

## EAST COWES. I.W.

Erecting & Testing

Solent Yard, Cowes &  
Osborne Works, E. Cowes

SEAPLANES

West Medina Aerodrome  
East Cowes

LAND MACHINES

Telegrams "CONSUETA EAST COWES"  
Phone COWES 193 (4 Lines)



## The late Walter Staner.

It is with very deep regret that one records the death of Mr. H. W. Staner, the editor of "The Autocar." Mr. Staner had been ill with pneumonia for the past month, and the anxiety of his friends was relieved last week by the news that he was out of danger. Unhappily a relapse occurred, and he died on Sunday last, the 3rd of February.

Walter Staner was one of the most lovable men who ever lived, as well as one of the cleverest and hardest workers. He had immense foresight coupled with the soundest of judgment, both of men and events. He was a keen cyclist, a hard rider possessing both speed and staying power, and in the early days of cycling, long before pneumatic tyres were invented, he joined the staff of "The Cyclist," then edited by Mr. Henry Sturmey, and the first great success of the house of Iliffe. The sport of cycling, and the cycle trade, owed much to his excellent work on that paper, and when he became its editor he maintained and improved its position in the world, until cycling became so vulgarised as to be able to dispense with journalistic attention of the better class.

### THE FIRST MOTOR PAPER.

When the automobile began to be a serious vehicle instead of a perambulating joke the firm of Iliffe at once realised its possibilities, and started a motor paper in a small way, as an off-shoot of "The Cyclist," choosing for it the strange title of "The Autocar." The title of the paper is the one word which is never used to describe the vehicle, either conversationally or in print, so the pre-eminence of "The Autocar" to-day over all competitors is the outstanding proof of the fact that if a paper contains the right material its name does not matter.

As the sport of motoring grew, Walter Staner devoted his activities entirely to "The Autocar," merely keeping a watchful eye on the firm's other papers, and the kindest of restraining hands on the unseemly exuberance of their editors and contributors, lest in their youth and inexperience they should perpetrate some atrocity which would not consort with the dignity of the house of Iliffe.

### THE LATE HARRY SWINDLEY.

"The Autocar" was fortunate in its material, for besides the sound political and mechanical sense and judgment of Walter Staner, it was able to publish the brilliant writing of poor Harry Swindley, who, after a long and distressing mental illness, happily without pain to its victim, died about three weeks ago. Harry Swindley was also on the staff of "The Cyclist," and was, besides being one of the best sportsmen who ever touched cycling, one of the most entertaining and descriptive writers, possessing a wonderful sense of humour and an enviable flow of language, both verbally and on paper. His descriptions of some of the big motor races on the Continent and of our little "Tourist Trophy" affairs in the Isle of Man remain to-day joyous and exciting reading.

Curiously enough, Harry Swindley took hardly any interest in flying, and devoted himself to the end to the road motor in its various manifestations. We who belong to the old days of mechanical sport mourn his loss deeply, though for his own sake we rejoice that he is free from his afflictions.

### THE FIRST FLYING PAPER.

As an example of the foresight of Walter Staner and Mr. William Iliffe—whose death one had to record only a few months ago—one must point out that in 1902, some years before anyone flew, the firm produced a most

interesting quarterly publication called "Flying," which was devoted necessarily chiefly to balloons and airships. One gathers that the title has since been adopted by a paper entirely unconnected with Iliffe & Sons, Ltd., so it may be well to point out the disconnection, to prevent confusion.

When aeroplanes began to become practical, Walter Staner saw that the time had come for a new move. The first aeroplane show in the world took place in Paris at Christmas, 1908, and there were shown the wonderful machines on which Wilbur Wright, Farman, Bleriot, and, I think, Latham had flown, besides numerous others, such as the Bréguet, on which people had attempted to fly.

Harry Swindley was to have described the show for "The Autocar," but he was too busy, or not inclined for Paris in winter, so Staner sent me instead, and thus gave me my first chance of writing on aircraft, a subject of which I knew nothing and for which I cared less. Actual acquaintance with what was being done in France changed my views entirely, and thenceforward nothing except aircraft has been of any serious interest. So I can say that to Walter Staner I owe whatever I have worth having of this world's goods, including this paper—or rather my share of it.

### THE OLD "AERO."

Thereafter Staner turned me on to write articles on aviation, and later, when the firm of Iliffe, of which he was the only director outside the Iliffe family, decided to start "The Aero," he chose that it should be edited conjointly by Wilfred Aston and me. Why we called it "The Aero" instead of continuing the title of "Flying" I cannot remember, but I know that Staner had excellent reasons, and one could never find any sound argument against any reasoned proposition which he set forth.

The composition of "The Aero" was a thing of joy, and I believe that Staner loved it as much as we did. Aston and I were about the worst editors that ever happened. We were both young—at least he was—and both full of the confidence of complete ignorance; we were firebrands of the most dangerous kind, and, having no property of our own, were cheerfully contemptuous of the Law of Libel; we fought like cat and dog, until our common sense of humour turned our anger into laughter. And Walter Staner handled the pair of us as a skilful whip handles a pair of horses which are too "full of beans."

His word was law, not because either of us cared to hang for any law, but because we loved Staner, because either of us would have done anything rather than hurt his feelings, and because he was always the essence of reasonableness and always had sound reasons for everything.

### FORESIGHT.

I have known Walter Staner for some twenty-two years, and in all that time I have never once seen his judgment proved wrong. As to his foresight, I well remember him saying, not later than the end of 1905, that if we in this country had any sense, we would simply send our Fleet into the Heligoland Bight and into the Baltic, and order Germany to hand over her fleet, as it was a menace to the peace of the world. As he said then, over twelve years ago, we were strong enough in guns to blow Germany's coast towns to pieces if she refused to give up her fleet, and if she ever dared to start building another after handing it over. He said that Germany's fleet was only intended as cover for her armies when the time came for the great European





# ROLLS-ROYCE

*Contractors to H.M. Government.*

ROLLS-ROYCE AERO ENGINES  
LIKE  
ROLLS-ROYCE CARS  
ARE

*THE BEST IN THE WORLD.*

THE WORLD'S RECORDS ARE  
HELD BY ROLLS-ROYCE AERO ENGINES

## CLIMBING

An aeroplane fitted with ROLLS-ROYCE engine holds the WORLD'S RECORD FOR RAPID CLIMBING.

## SPEED

An aeroplane fitted with ROLLS-ROYCE engine holds the WORLD'S RECORD FOR SPEED in the air.

## RELIABILITY

An aeroplane (Handley Page) fitted with ROLLS-ROYCE engines holds the WORLD'S RECORD FOR LONG DISTANCE FLIGHT under war conditions viz.: London to Constantinople.

## WEIGHT CARRYING

An Aeroplane (Handley Page) fitted with ROLLS-ROYCE engines holds the WORLD'S RECORD FOR WEIGHT CARRYING - viz.: London to Constantinople total weight SIX TONS

## PASSENGER CARRYING

An aeroplane (Handley Page) fitted with ROLLS-ROYCE engines holds the WORLD'S RECORD for carrying 22 PERSONS to a height of 7,000 FEET.

ROLLS-ROYCE, Limited, 14 & 15, Conduit Street, London, W.1.

Telegrams: Rollhead Reg., London.

and at

Telephones: 1654 Gerrard (3 lines)

Paris, New York, Petrograd Madrid, and Bombay



War, which he knew was coming, and that without a fleet Germany would not risk such a war. He also strongly advocated conscription in this country, so that when whatever war was coming did break out we should be properly ready for it.

Yet despite these warlike views Walter Staner was the least quarrelsome of men. He did not suffer fools gladly, and it was worth quite a great deal to hear him describe any particular fool who annoyed him—and such were not scarce in Coventry—but I have never seen him angry with anyone. He was indeed a singularly peaceful person, but one of those peaceful persons with whom one would rather not quarrel, because somehow he gave one the impression that beneath his peacefulness was the power to be extraordinarily unpleasant if necessary.

AVE, ATQUE VALE!

It is, perhaps, rather a pity that his fighting quality was never brought out, for if it had been he had the force of character, the absolute honesty of purpose, and

the mental ability to have become a very great man. As it was, he devoted the best years of his life to furthering the cause of motoring and the development of the petrol engine in a period when the deadly apathy of profitable peace enwrapped the world. In that cause none could have done better, very few could have done so well. Not only all motorists but all aviators owe a great debt of gratitude to Walter Staner: far greater than any but a few of them can possibly realise.

Unhappily for the human race, Walter Staner leaves no children to transmit his high mental and moral qualities to posterity, but in his life of strenuous work for more than twenty years he was cheered and aided by his wife, one of the most loyal and devoted women with whom God has seen fit to bless this earth. To this lady in her loneliness all will offer their deep and sincere condolences. His friends will console themselves with the knowledge that to whatever rest Walter Staner has gone, his new abiding-place will be the better for his presence.—C. G. G.

### AIR RAIDS OF 1917.

The following list of air raids on England during 1917 may be of interest for comparison with similar events during 1918.

March 1st. One German aeroplane raided Broadstairs at 9.50 a.m. One woman killed.

March 16th. One German aeroplane raided Westgate-on-Sea at 5.30 a.m.

March 17th. German airships raid the South Eastern Counties of England. Bombs dropped in Kent.

April 5th. German aeroplanes raided Kentish coastal towns at 10.45 p.m. Eight bombs were dropped.

May 7th. One German aeroplane raided North-East London at 12.40 a.m. Four bombs were dropped. One man killed, and one man and one woman injured.

May 24th. Four or five German airships raided East Anglia. One man killed.

May 25th. Sixteen German aeroplanes raided South East England (German Communiqué says Folkestone) between 5.15 and 6.30 p.m. Killed, 76; injured, 174. Admiralty claim three brought down.

June 5th. Sixteen German aeroplanes raided Thames Estuary and adjoining districts of Essex and Kent and establishments in the Medway (German Communiqué says Sheerness) at 6.30 p.m. Killed, 12; injured, 36. Two machines brought down.

June 13th. Fifteen German aeroplanes raided East-End of London, North Foreland, and the banks of the Thames at 11 a.m. Killed, 97; injured, 439. Germans claim one British machine brought down. The raid was of 15 minutes' duration.

June 17th. Two German airships raided East Anglia and Kent. One Zeppelin brought down. Six bombs in Kent. Two killed, 16 injured.

July 7th. About 20 German aeroplanes raided London, Isle of Thanet and East Coast of Essex (German Communiqué says Margate) at 9.30 a.m. One machine brought down by R.F.C. Fifty-nine killed, 193 injured.

July 14th. Twelve or fourteen German aeroplanes raided Harwich at 7 a.m. British claim two machines brought down on return journey off Belgian coast. Eight killed, 22 injured.

July 22nd. Fifteen to 21 German aeroplanes raided Felixstowe and Harwich at 8 a.m. One machine brought down by R.F.C. off Belgian coast. Germans claim all aeroplanes returned. Thirteen killed, 26 injured.

August 12th. Twenty German aeroplanes raided Margate and Southend. At 5.15 they appeared off Felixstowe going South. Forty bombs dropped at Southend. Twenty-three killed, 50 injured. One machine brought down.

August 22nd. One or two German airships raided Mouth of the Humber at 11.15 a.m. Twelve explosive and thirteen incendiary bombs dropped. One man injured.

Ten German aeroplanes raided Ramsgate, Margate, and Dover at 1.10 p.m. Eleven killed, 13 injured. Two machines brought down.

Sept. 2nd. One German aeroplane raided Dover. Seven bombs dropped. One killed, six injured.

Sept. 3rd. Six German aeroplanes raided Chatham, Isle of Thanet, Sheerness (German Communiqué says Ramsgate) between 10.40 and 11.30 p.m. One killed, six injured.

Sept. 5th. Twenty German aeroplanes raided London at 10.30 p.m. (German Communiqué says Margate and South-

end as well). Nine killed, 49 injured. One machine brought down off Sheerness.

Sept. 24th. German airships raided coast of Yorkshire and Lincolnshire between midnight and 3 a.m. Three injured.

Sept. 25th. German aeroplanes raided London and South East England at 7.45 p.m. Seven killed, 25 injured.

Sept. 27th. About 20 German aeroplanes raided London, Suffolk, Essex and Kent. No casualties. Two machines brought down.

Sept. 29th. German aeroplanes raided London, Kent, and Essex between 8 and 9 p.m. Eleven killed, 82 injured.

Sept. 30th. German aeroplanes raided London, Kent, and Essex at 6.40 and 8 p.m. Nine killed and 42 injured. One machine brought down.

Oct. 1st. German aeroplanes raided London, Essex, and Kent between 7 and 10 p.m. Ten killed, 38 injured.

Oct. 19th. German airships (six or seven) raided London and East and North Eastern Counties. Thirty-four killed, 56 injured.

Oct. 29th. German aeroplanes attempted to raid the South Eastern Counties. No casualties.

Oct. 31st. One aeroplane raided Kentish coast at 4.30 a.m. No casualties.

Nov. 31st. German aeroplanes raided London, Kentish and South East coasts at 10.45 and 11.50 p.m. Eight killed, 21 injured.

Dec. 6th. About 25 German aeroplanes raided London, Kent, and Essex at 1.30, 4.0, 4.30 and 5 a.m. Seven killed, 11 injured. Two machines were brought down.

Dec. 18th. Sixteen to 20 German aeroplanes raided London, Kent, and Essex between 6.15 and 9 p.m. Ten killed, 75 injured. Two machines were brought down.

Dec. 22nd. German aeroplanes raided the Kentish coast at 6 p.m., when one machine was brought down, and at 9.30 p.m., when bombs were dropped in the Isle of Thanet. No casualties.

### THE SPRING IS COMING.

The correspondent of the "Morning Post," writing from the British front on Jan. 31st, says:—

The raids on London are not the only sign of increased German activity in the air. Bombing expeditions on a large scale have been made over the British lines this week, some of them involving at least twenty powerful aeroplanes of the three-seater type. East of Bapaume the raiders have been attempting a regular air offensive under cover of darkness, attacks being made at half-hour intervals by machines grouped in three distinct "waves."

The failure of the raiders to do any serious damage suggests that they have other motives than mere destruction of property.

I am inclined to think the German airmen may be practising new methods of attack and manœuvring on a large scale in preparation for the much-talked-of "Spring offensive." We hear stories of the recent increase in the personnel of the enemy's air service, and information from various sources suggests that special inducements are being offered to officers and non-commissioned officers to enter that branch of the Army. New flying schools have been established in Belgium and Northern France for the training of battle squadrons.

Prisoners indicate that the German military authorities take a very serious view of the coming Allied offensive in the air, and are doing all they can to meet it. In fact, their airmen are more energetic just now than any other of their forces on the Western front.



# The New Steel

## COBALTCROM PATENT AIR HARDENING HIGH-SPEED STEEL.

(British Patent No. 106187.)

**T**HIS Steel is now in regular use in more than one thousand works in Great Britain, and its efficiency as a first-class utility High-speed Steel is firmly established.

The hardening of Cobaltcrom Steel by the new method introduced this year is simpler, surer and less risky than that of any known High-speed or High-duty Alloy Tool Steel, and practically dispenses with all skill hitherto regarded as indispensable for hardening High-grade Tools.

The adoption of Cobaltcrom Steel results in considerable saving of labour and marked increase in armament, motor, aircraft and shipbuilding production; in fact, beneficially affects every industry where steel tools are used.

It is the ideal universal tool steel for general maintenance in machine and repair shops of all classes of industry, as tools, by slight variation in the heat treatment, can be made either shock-resisting or extra hard.

Tool room problems which have been regarded as impracticable have been solved by the adoption of Cobaltcrom Steel in bars, sheets, and, in particular, Form castings.

Send your Manager, Foreman, or Tool Room Superintendent to Sheffield to see our exhibition of milling cutter and other castings in "The New Steel."

MANUFACTURED UNDER LICENCE BY

**DARWIN & MILNER, LTD.,**  
**SHEFFIELD.**

**SYBRY, SEARLS & CO., LTD.,**  
**SHEFFIELD.**

Manufactured under licence in the United States of America by the Latrobe Electric Steel Co., Latrobe, Pa., and Darwin & Milner, Inc., New York.



## Deductions from the World War: A Review.—(Continued.)

BY HENRY FORESTER.

### OUR DEFECTS.

The Baron von Freytag-Loringhoven, with all the trained soldier's delight in codifying his impressions, gives briefly and clearly his opinion of the varying qualities of the Allied Armies in the field. England, saved from utter ruin by the foresight and courage of Field-Marshal Lord Kitchener in building the vast New Armies on the traditions and principles of the old regular troops, was and is handicapped by the lack of any efficient form of national service in pre-war days. "... the new English divisions could not attain either the coherence of the old troops of the expeditionary army first dispatched to France or the fighting value of the French troops, owing to France's 'possession of universal military service.'

"The English reached a high degree of technical efficiency, and their fighting tactics remained defective" (p. 31). He says that the English people had no clear idea of the national aims in war, and fought possessed only of a blind hatred against all things of Germanic origin. In which there may be some truth and a compliment of high value.

### THE SPIRIT OF FRANCE.

France, with her memories of the glorious days when the proud flag of the Bourbon dynasty flew in supremacy over the greater part of the Northern American Continent, in India and in Central Europe, he holds to be possessed of a high national ideal and of a definite purpose in war which invigorates the soldiery and cleanses the political arena. The French fight for the unity of France and for a proper place in the great world. Universal military service has disciplined the whole nation, and has furnished an "appropriate vessel for its always very strongly developed sense of unity. Those who judged the French nation by the customary standards have been astonished at their conduct in this War" (p. 30).

### THE RUSSIAN FAILURE.

Russia he considers to be in the main lacking in that education which will render a war for world-position popular among the masses. The training of her armies had improved vastly since her struggle with Japan in the early years of the century, but their loyalty to his Imperial Majesty the Tsar had declined, owing, though our author does not say so, to the machinations of what might properly be called the technical classes of the community. Huxley once said that his devotion to science had destroyed his finer perceptions, and perhaps some day a candid engineer will admit that a lifelong submission to the mechanical destroys with equal speed and deadly certainty all belief in the higher national ideals which bring a monarch and his people to a chivalrous pre-eminence in the counsels of the world.

The Russian Empire, vast in its extent, lacked cohesion. The bureaucracy, handicapped by the advance of liberal opinion at a pace greatly in excess of the proper methods of education, and also by the shortage of money, was neither able to inspire the troops with confidence nor to equip them adequately for the great task so swiftly and carelessly undertaken.

Hence the Russian armies, enormous in size, fell before the superior skill and greater mobility of the troops of the Central Empires. At the very moment when bitterly earned experience had increased their efficiency to a degree when the Russians might reasonably have expected to drive the enemy, harassed as he was on other fronts, beyond the borders of Russia, the disloyal

element in the country seized its opportunity and turned the prospects into irretrievable defeat, the paths of honour into a morass of disgrace.

Of other countries allied to Great Britain the Baron von Freytag does not speak. Their influence on the world war has not been such as would add greatly to the lure of militarism.

### THE TECHNICAL FALLACY.

He devotes an interesting chapter to "The Influence of Technical Science" on war. It has been the habit of the newsprints, published daily as a kind of moral hair-shirt for the mortification of our souls, to speak of the present hostilities as the special and peculiar province of the technical expert and of the "business" man, while the soldier proper provides the cannon-fodder without which war would lose its primary reason.

This view is held because of the "great significance of technical science in the present war, as regards the effectiveness of weapons, protection against these weapons, organisation of transport and intelligence services, and also aerial warfare" (p. 47).

It has been a little forgotten that the skilled civilian, valuable though his services have been since August, 1914, would have been of little assistance without the directing brain of the soldiers in command. No invention of military value has yet been forced on the soldier by external genius. Each modification or expansion of the technical in war has been the result of military needs in the field, and has been developed by fighting experience.

### MECHANICAL AIDS.

Von Freytag admits that in peace one could not realise the true significance of technical science in war, and that recent hostilities between nations, such as the Boer War and the Russo-Japanese War, proved but little. The two latest of the greater developments—the aeroplane and the motor-car—had only reached a moderate standard of efficiency in the years immediately preceding the present war. They were, it is true, employed in the tribal conflicts of the Balkans within the last ten years, but not to such extent as would give data for the future.

The railways have, since their inception, been regarded as of high military importance, yet no nation save Germany made any consistent effort in the days of peace to lay railroads with a due regard to strategic requirements. The German railroads in East Prussia and on French frontiers ran in directions which, if not always favourable to commercial needs, nor pleasant to the *flaneur*, assisted the rapid transport of German troops to strategic points where it was desirable to join battle.

[Vide Mr. Prevost Battersby's brilliant articles in the "Morning Post" a few months before the war.—Ed.]

(To be continued.)

### AEROPLANE PROPAGANDA.

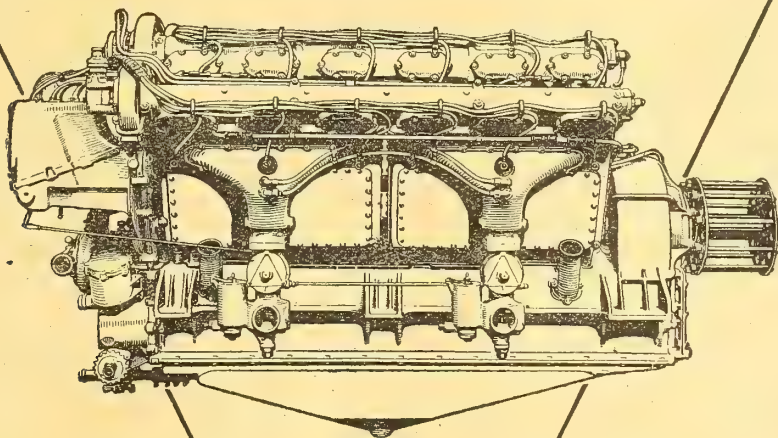
The special correspondent of the "Morning Post," who was with the Belgian Army during the first months of the war, writes, apropos the sentence of ten years' penal servitude on two British officers for dropping leaflets on German troops:—

"I can give a specific instance of use by the Hun of aeroplane propaganda in Belgium. In Sept., 1914, during the early stages of the siege of Antwerp, a Hun aeroplane came over the city dropping leaflets in the French language. These appealed to the Belgian soldiers to lay down their arms, not to fight against the German, 'who were their true friends,' and informed the Belgians that King Albert was leading them to destruction. I was not able to secure a copy of the leaflet to forward to you, as the copies picked up were treasured as souvenirs by their finders. But I read one of the leaflets and reported the incident to the 'Morning Post' at the time."



# SUNBEAM-COATALEN AIRCRAFT MOTORS

Are engaged in playing their parts in well nigh every theatre in which the Allies' arms are engaged, and have won distinction in this test of unprecedented proportions and duration.



12 CYLINDER  
SUNBEAM-  
COATALEN  
AIRCRAFT  
ENGINE.



THE SUNBEAM MOTOR CAR CO., LTD. ————— WOLVERHAMPTON.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



THE BRITISH & COLONIAL  
AEROPLANE CO., LIMITED

— FILTO , BRISTOL —

CONSTRUCTORS OF

*The "Bristol" Aeroplanes.*

— CONTRACTORS TO —  
H.M. AIR FORCES.

Telegrams:  
"AVIATION, BRISTOL"

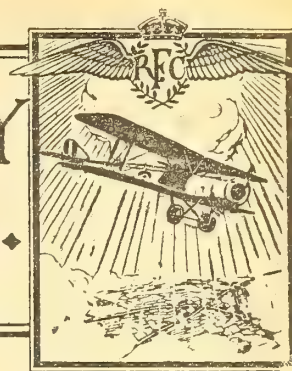


Telephones:  
3906 BRISTOL  
(Private Branch Exchange)





# NAVAL *and* MILITARY • AERONAUTICS •



## FROM THE "LONDON GAZETTE."

ADMIRALTY, Jan. 22nd.

JAN. 24th.—R.N.A.S.—Temp. Flt. Lt. (actg. Flt. Comdr.) to be temp. Flt. Comdr.:—A. Brind (March 8th, 1917).

JAN. 25th.—To be temp. Flt. Lt.:—F. E. Rogers, Jan. 23rd

JAN. 26th.—R.N.A.S.—Temp. Flt. Sub-Lt. to be temp. Flt. Lt.:—J. K. Fryer-Smith (Dec. 31st, 1917.)

WAR OFFICE, Jan. 29th, 1918.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—MIL. WING.—Sqn. Comdrs.—From Flt. Comdrs., and to be temp. Maj. whilst so empld.:—Lt. (temp. Capt.) A. Gray, M.C., Arg. and Suthd. Highrs., T.F. (Dec. 28th, 1917); Temp. Capt. H. V. Stammers, Gen. List (Jan. 15th).

Flt. Comdrs.—From Flying Officers, and to be temp. Capt. whilst so empld.:—Temp. Sec. Lt. F. G. Quigley, Gen. List (Jan. 6th); Lt. A. G. Whitehead, W. York. R., T.F. (Jan. 10th); Lt. P. M. L. Edmunds, Lrs. (Jan. 11th).

Equipt. Officers, 1st Cl.—Sec. Lt. (temp. Lt.) A. S. F. Morris, Spec. Res., from the 2nd Cl., and to be temp. Capt. while so empld., Jan. 13th.

SCHOOLS OF INSTRN.—SCHOOL OF TECHNICAL TRAINING.—Park Comdr.—Temp. Capt. C. G. Docwra, Lab. Corps, to be transf'd. to R.F.C. Gen. List, and to be temp. Maj. whilst so empld., Nov. 5th, 1917.

WAR OFFICE, Jan. 30th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—MIL. WING.—Flt. Comdrs.—Lt. (temp. Capt.) E. G. Landon, Spec. Res., from a special appt. (graded as an Equipt. Officer, 1st Cl.), and to retain his temp. rank whilst so empld., Jan. 11th, seny. Oct. 1st, 1916; Temp. Sec. Lt. R. A. George, Gen. List, from a Flying Officer, and to be temp. Capt. whilst so empld., Jan. 14th.

Balloon Co. Comdrs.—Graded as Sqdn. Comdr.—Lt. (temp. Capt.) H. P. L. Higman, R.E., T.F., from a Balloon Co. Comdr. (graded as a Flt. Comdr.), and to be temp. Maj. whilst so empld., Dec. 11th, 1917. Graded as a Flt. Comdr.—Temp. Lt. F. B. Stevens, Gen. List, from a Balloon Comdr. (graded as a Balloon Officer), and to be temp. Capt. whilst so empld., Dec. 11th, 1917.

WAR OFFICE, Jan. 31st.

REGULAR FORCES.—STAFF.—The following temp. appt. is made at the War Office:—Staff Lt.—Lt. B. D. Bellamy, Essex R., from a Flying Officer, vice Sec. Lt. (temp. Capt.) A. O. Betts, R.F.C., Spec. Res., Jan. 1st.

ESTABLISHMENTS.—R.F.C.—MIL. WING.—Equipt. Officers, 1st Cl.—Maj. C. C. Colley, R.A., from a Special Appt., Ministry of Munitions (graded as a Staff Capt. at War Office), Dec. 28th, 1917; Temp. Capt. R. G. Taylor, Gen. List, from the 2nd Cl.; Sec. Lt. (temp. Lt.) A. O. Betts, Spec. Res., from a Staff Lt., and to be temp. Capt. whilst so empld., Jan. 1st.

SCHOOLS OF INSTRN.—SCHOOLS OF MIL. AERONAUTICS.—Instr.—Graded as an Equipt. Officer, 1st Cl.:—The grading of temp. Capt. C. G. Durham, Gen. List, is as now described, and not as in "Gazette" of Oct. 15th, 1917.

GEN. LIST.—Temp. Capt. A. E. Thomas relinquishes his commn. on account of ill-health, contracted on active service, and is granted the hon. rank of Capt., Feb. 1st; Capt. J. Hewitt, S.A. Inf., to be temp. Capt., Oct. 1st, 1917.

WAR OFFICE, Feb. 1st.

REGULAR FORCES.—STAFF.—Staff Capt.—Lt. A. L. Butcher, R.F.C., Spec. Res., from a Staff Lt., and to be temp. Capt. whilst so empld., Jan. 1st, 1918.

ESTABLISHMENTS.—R.F.C.—MIL. WING.—Adj't.—Capt. G. C. May, Bord. R., and to be seed., Jan. 3rd.

Equipt. Officers, 1st Cl.—Temp. Lt. W. A. Andrews, Gen. List, from the 2nd Cl., and to be temp. Capt. while so empld., Dec. 14th, 1917.

SCHOOLS OF INSTRN.—SCHOOL OF TECHNICAL TRAINING.—Park Comdr.—Temp. Capt. G. K. Field, Gen. List, and to be temp. Maj. whilst so empld., Jan. 16th.

MEMORANDUM.—Sert-Maj. A. Jukes to be Sec. Lt., for duty with R.F.C., Dec. 29th, 1917.

WAR OFFICE, Feb. 2nd.

REGULAR FORCES.—STAFF.—SPECIAL APPOINTMENTS.—Graded for purposes of pay as a Brig.-Maj. while empld. as Sec. in Comd. of an R.F.C. Cdt. Wing.—Maj. A. M. Grenfell, D.S.O., Yeo., T.F., vice Bt. Maj. K. F. Woolhouse, Notts and Derby R., Spec. Res., Jan. 1st.

R.F.C.—ESTABLISHMENTS.—MIL. WING.—Staff Officer, 3rd Cl.—The appt. of Lt. V. Buxton, Leic. R., notified in the "Gazette" of Dec. 11th, 1917, is post-dated to Dec. 22nd, 1917.

Flt. Comdrs.—From Flying Officers, and to be temp. Capt. while so empld.:—Temp. Sec. Lt. J. B. Fox, Gen. List, Dec. 28th, 1917; Lt. F. H. Hodgson, Spec. Res., Jan. 17th.

SCHOOL OF INSTRN.—SCHOOLS OF MIL. AERONAUTICS.—Comdt.—Graded as a Sqdn. Comdr.—Capt. J. E. Dixon-Spain, Hamps. R., a Flt. Comdr., and to be temp. Maj. while so empld., March 14th, 1917.

Chief Instrs.—Graded as a Park Comdr.—Temp. Capt. C. E. I. C. Anne, Gen. List, a Flt. Comdr. (since decd.), and to be temp. Maj. whilst so empld., March 28th, 1917. Graded as a Sqdn. Comdr.—Temp. Capt. C. Danby, M.C., Gen. List, a Flt. Comdr., and to be temp. Maj. whilst so empld., vice Capt. C. E. I. C. Anne, Gen. List (dec'd.), April 16th, 1917.

Instrs.—Graded as a Flt. Comdr.—Temp. Capt. F. D. Berridge, Gen. List, a Flt. Comdr., March 14th, 1917. Graded as an Equipt. Officer, 1st Cl.—Temp. Sec. Lt. F. Crompton, Gen. List, and Equipt. Officer, 3rd Cl., and to be temp. Capt. whilst so empld., March 14th, 1917.

Asst. Instrs.—Graded as Equipt. Officers, 2nd Cl. and to be temp. Lts. whilst so empld.:—Temp. Sec. Lt. (on prob.) B. Benson, Gen. List, and to be confirmed in his rank, July 13th, 1917; temp. Sec. Lt. N. Goodwin, Gen. List, an Asst. Instr. in Gunnery (Graded as an Equipt. Officer, 3rd Cl.), Aug. 30th, 1917.

Asst. Instr. in Gunnery.—Graded as an Equipt. Officer, 2nd Cl.—Temp. Sec. Lt. R. C. Nicholls, Bedf. R., to be transf'd. to R.F.C. Gen. List, and to be temp. Lt. whilst so empld., March 17th, 1917.

Gen. List.—Temp. Sec. Lt. (temp. Capt.) P. Seymour relinquishes his temp. rank on ceasing to be specially empld., Jan. 26th; Sec. Lt. D. R. Thomas, an Equipt. Officer, 3rd Cl., to be temp. Capt. (without the pay or allowances of that rank) whilst specially empld., Jan. 26th.

The following from R.F.C. to be temp. Sec. Lts.—3rd Cl. Air Mech. F. S. Maxwell, Oct. 13th, 1917; Flt. Sert. F. C. Lyne, Nov. 3rd, 1917; 2nd Cl. Air Mech. A. E. Fallon, Nov. 12th, 1917.

Lt. O. T. Sloan, Sco. Rif., T.F., to be temp. Capt. (with pay and allowances as Lt.) whilst actg. as Adj., Dec. 18th, 1917.

WAR OFFICE, Feb. 4th, 1918.

The King has been pleased to confer the following rewards for gallantry and distinguished service in the Field. The acts of gallantry for which the decorations have been awarded will be announced in the "London Gazette" as early as practicable:

### THE DISTINGUISHED SERVICE ORDER.

Sec. Lt. (Temp. Capt.) J. T. B. McCudden, M.C., Gen. List and R.F.C.

Sec. Lt. (Actg. Capt.) A. E. McKeever, M.C., R.F.C., Spec. Res.

### A SECOND BAR TO THE MILITARY CROSS.

Sec. Lt. (Temp. Capt.) A. C. Youdale, M.C., R.F.C., Spec. Res. (1st Bar gazetted Oct. 27th, 1917) (M.C. gazetted Sept. 26th, 1917).

### A BAR TO THE MILITARY CROSS.

Lt. (Temp. Capt.) CONRAD-LALLY, M.C., R.F.C., Spec. Res. (M.C. gazetted Jan. 18th).

Lt. (Temp. Capt.) L. J. MacLean, M.C., R.E., and R.F.C. (M.C. gazetted Oct. 2nd, 1915).

### THE MILITARY CROSS.

Capt. J. C. L. Barnett, Oxf. and Bucks L.I. and R.F.C.  
Sec. Lt. (Temp. Capt.) C. E. Barrington, R.F.C. and R.F.C.  
Temp. Sec. Lt. B. D. Bate, Gen. List and R.F.C.  
Temp. Lt. R. S. S. Brown, Gen. List and R.F.C.

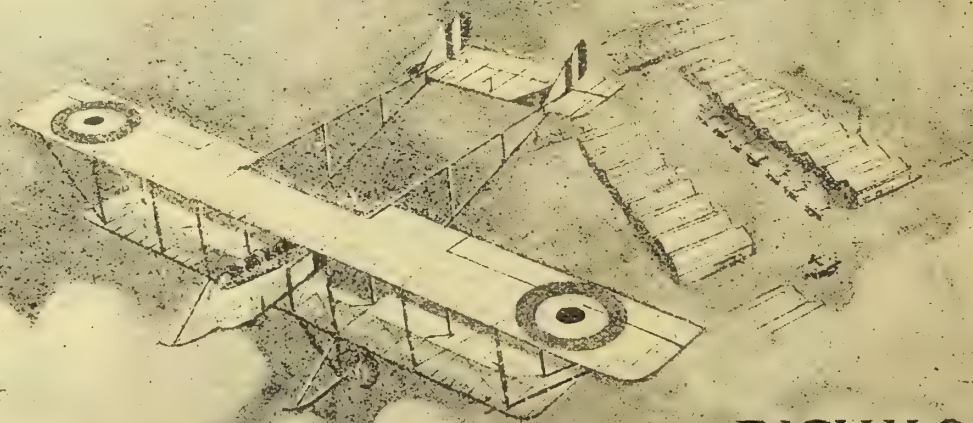
(Continued on page 591.)





# WHITEHEAD

## AIRCRAFT



GEORGE WATSON

### RICHMOND

SURREY



# **GNÔME & LE RHONE ENGINE COMPANY**

**Contractors to the  
War Office and Admiralty**

**London Offices :**

**27, BUCKINGHAM GATE, S.W.1., and THE HYDE, HENDON, N.W.9.**

**Works: Blackhorse Lane, Walthamstow.**



“ “ **CONTRACTORS TO** “ “  
**HIS MAJESTY'S WAR OFFICE**

*Messrs. Gordon Watney & Co. Ltd*

**AERONAUTICAL AND  
GENERAL ENGINEERS**

**South Lodge Motor Factory**

**WEYBRIDGE**



**Telephones WEYBRIDGE 550 (7 lines),      Telegrams: "MERCEDES, WEYBRIDGE"**



# AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER

## The British Aircraft Industry.

(SECOND SERIES.)

BY R. P. HEARNE.

### V.—BROWN BROTHERS, LTD.

Some day I hope to write a monograph tracing the descent of the aeroplane from the bicycle! It may shock many aeronautical students to have such a relationship suggested, but my attention was first drawn to the matter in my early correspondence with the Wright Brothers, many years before they came to this country.

The Wrights told me that they were bicycle mechanics, and that this training and experience had been of great assistance to them. As an ardent cyclist myself I found that the feelings of speed and power engendered by cycling gave one an interest in the flight of birds and the possibility of human flight. Motor-cycles and motor-cars came to meet the craving for more speed, and it was the cyclist who built up the motor movement.

The petrol motor made the aeroplane a practical proposition, and to-day it is very curious to trace the many well-known people who have passed through the three phases of locomotion. I shall not spoil my other article by going into details here, but mention of the Wright Brothers and the Farman is quite sufficient to bear out my contention that the aeroplane owes a great deal to the bicycle.

#### THE UNIVERSAL PROVIDERS.

Every old cyclist in Europe will remember how the business of Brown Brothers grew up with the cycle industry: every motorist knows how the same firm took up the collection and supply of motoring fittings and accessories: and now to bear out my theory of evolution we find that Brown Brothers, Ltd., added an aircraft supply department to their business almost as soon as war broke out.

To me it seems very remarkable that a great business firm should keep step with three of the most important phases of mechanical locomotion, for to the ordinary observer, and, indeed, to the younger men in each section, there seems little to connect the bicycle with the motor-car, or the motor-car with the aeroplane.

#### ENTERPRISE VERSUS CONVENTIONALITY.

The uprise of the firm of Brown Brothers has had an important effect, too, on each of the industries. According to the engineering experts of the day, the early bicycle was generally labelled

"a mechanical absurdity." The pneumatic tyre was another "freak." The motor-car was a "monstrosity," and the aeroplane was a compound of absurdity, freak, and monstrosity.

In all these despised industries it was vitally essential that enthusiastic yet astute men should collect materials and supplies and bring the manufactured articles within easy reach of the public. Here it was that Brown Brothers did immense service, and it is all the more to their credit that they accomplished this work on sound business lines.

#### INFANTILE ALIMENTATION.

The infancy of the three industries was very much the same. The early manufacturers were little more than amateurs, and they were often in difficulty about finding raw or partly finished materials for their work. The experimenter was even more badly placed, and the user who wanted extra fittings or spare parts for his bicycle or his motor-car, or his aeroplane had countless troubles and delays.

The business of Brown Brothers has been, and is, to help all those people. Their first great task in the early days of the cycle movement was to keep the accessory and fittings manufacturers steadily employed by placing

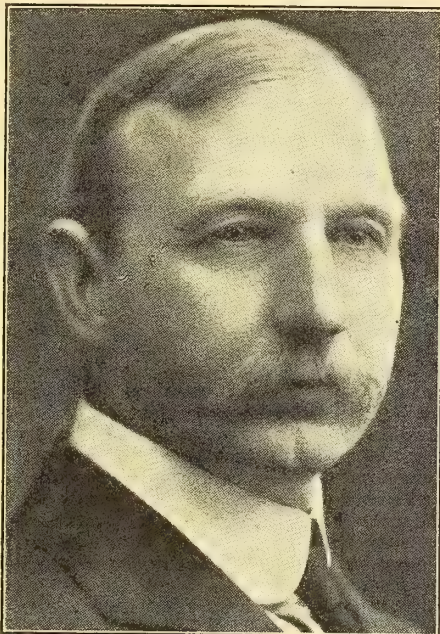
large orders with them. This had a most important stabilising effect, and it created general confidence. The Browns appeared to take great risks by ordering pedals, or sparking plugs, or wire strainers by the thousand, but they had faith in the future of the three industries, and the correctness of their views has been amply proved.

#### A TRADE RESERVOIR.

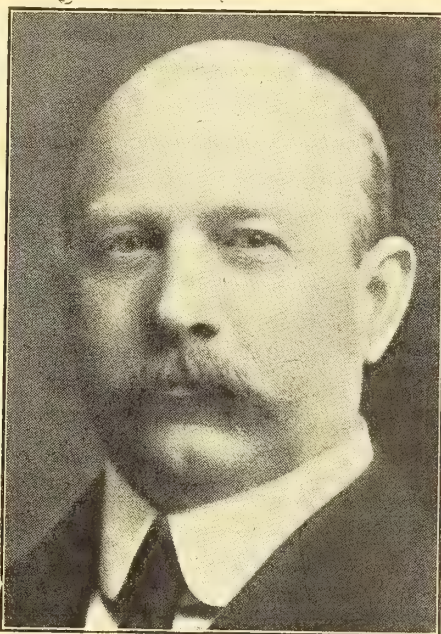
So it has come about that a gigantic reservoir of parts, fittings, accessories, tools, etc., has been established by the enterprise of this firm, and from every part of the world demands come which could only be met by an organisation of this character. The number of different items dealt with runs into tens of thousands, and in the Aircraft Section alone the total stock of articles amounts to several millions.

#### COMMON PROPERTY.

Although my concern here is with the Aircraft Section, I have found it desirable to deal with the other sections also, not only as showing the trend of evolution, but because it is



Mr. Ernest Brown.



Mr. Albert Brown.



well to point out that the three industries merge in various respects. Ball bearings, pneumatic tyres, wire wheels, steel tubing, fabric, leather fittings and upholstery, high grade steels, and many other items are common to cycling, motoring, and aviation. Engine equipment is yet more closely connected in motoring and flying, and now some of the new things peculiar to aircraft are beginning to trickle back into motoring.

This theme could be pursued with great interest, for I am wholly opposed in theory and practice to the stagnation of design and the rigid standardisation of manufacture. More especially, of course, does this apply to aircraft work, as now and again we find cock-sure people asserting that the limit of development has been reached in this or that part. I could tell them of similar cock-sure people who regarded the solid tyred bicycle of 1890 and the motor-car of 1903 as the last words in their respective lines! The aeroplane of 1918 will cut a quaint figure in 1928.

#### THE BROWNS OF ESSEX.

But I must turn from this matter to the history of the Brown firm. It is a simple story. Three sturdy lads of Essex came to London in 1889 with the fixed idea of starting in business for themselves. Their names were Albert, Ernest, and John Smith Brown. They decided that they would sell bicycles, and, taking a little shop in Great Eastern Street, they started. If three young men of Essex came up to town to-day and decided that they would sell aeroplanes for themselves the undertaking would have been hardly less abnormal.

Very soon the brothers found their feet, and by working hard and in complete accord they built up a sound business. Albert and Ernest were not long in showing their remarkable enterprise and acumen. They foresaw the demand for bicycle fittings, bought largely, and were able to meet the requirements. They were prepared for the bicycle boom, and instead of getting swamped by it they utilised it to carry forward their Argosy.

#### OWNING THE STREET.

Again they were alert in the early days of the motor movement. They looked ahead sagely, and when people were hunting about for this article or that, the Browns were able to come forward and offer to supply from stock at fair prices. To meet the requirements of the cycle, motor-cycle, and motor movements, and to cope with orders from all parts of the world, Brown Brothers had to enlarge their premises frequently, and now they own the best part of a big street.

Once again the firm rose to the occasion when a demand

came for aeroplane fittings. Even before the war they had been getting ready. The first indications came in the way of applications for tools, and for nuts, bolts and parts common to motor-cycles and motors, but soon it extended to the many specialised parts essential to the modern aeroplane.

#### A WAR OF MOVEMENT.

Shortly after war broke out Messrs. Brown Brothers organised a separate department for aircraft supplies, and, selecting a very capable manager, they quickly made a success of this section. The stock of A.G.S. and other parts runs into millions, and if the movement of these goods is any index to the number of aeroplanes being built, well—Germany will be astonished some day.

So extensive is the aircraft work at Browns that there is a staff of A.I.D. officials on the premises ceaselessly carrying out the mystic functions of their department. Messrs. Brown collect supplies from every available source, and they have the happy knack of feeling the pulse of the trade and making their arrangements well in advance of the demand.

#### LESSONS OF EXPERIENCE.

Here it is that the skilled business man scores so heavily over the official. The former has made his way by developing that power, knowing that his bread and margarine depend upon it. The official, even when an able man, is kept back by a bureaucratic system, which fears originality and has no incentive for going ahead. No Government department could carry on a business like Browns successfully and efficiently.

#### THE ALL-BRITISH BUSINESS MAN.

Personally, the Brown family are charming men, straightforward, unaffected, and hard workers. Success has not spoiled them in any way, and they stand out as representatives of the finest type of British business man, the type who is a sportsman as well as a commercial man, and who is above all the little tricks and sharp practices of which one saw so much in the Teutonic type.

The two moving spirits are Albert and Ernest, and they work in a very happy manner, one being slightly pessimistic and the other rather optimistic. A well-balanced decision flows from their joint deliberations, and, looking back over their long career in two very troubled industries, one sees how right their judgment has been. Their entrance into the Aircraft Industry is thus a good augury, and it is already proving of great assistance, both in regularising production and facilitating supplies.

## THE EXHIBITION OF GERMAN AIRCRAFT.

The note which appeared in this paper recently respecting the exhibition of German aeroplanes, engines, and aircraft components, at a certain well-known hall in London, has apparently caused considerable interest among the employees of aircraft firms.

Unfortunately it appears that some firms have not been sufficiently interested in the education of their employees to afford them the facilities to see the exhibition which have been placed at their disposal by the Air Ministry. Therefore, one would again draw the attention of the whole Aircraft Industry to the fact that any responsible person in the employ of an aircraft firm is entitled to visit the exhibition, and that it is within the power of the firm to issue passes to such individuals without having to apply to the Air Board.

A definite number of such permanent passes has been issued to each firm and these can be lent in turn to various employees who wish to visit the exhibition. Any firms which have not received passes by any chance can obtain them by writing to the Technical Department of the Air Ministry.

Naturally the establishment of this exhibition has involved considerable time and trouble, and, therefore, it is hoped that the privilege which is now extended to manufacturers in the Aircraft Industry to educate themselves and their employees as to the enemy's methods in design and construction will be used to the best possible advantage.

Be it said, the exhibits are not only educative as showing how material and labour can be saved, and how little difficulties such as the entire absence of certain materials can be overcome, but much can be learned both by designers and foremen as to how things ought not to be done in aeroplane construction. So far as aerodynamic design is concerned, this country has nothing to learn from the Germans, but it has quite a good deal to learn in economy of labour and material, and at this particular exhibition much may be learnt as to what to avoid.

If employees of aircraft firms still find difficulty in obtaining passes from their employers, they are invited to write to this office, mentioning what steps they have taken to obtain the necessary permits.

## EXONITE FITTINGS FOR AEROPLANES.

In the early days of aviation, when the average aeroplane was made in single examples each different from the other, and of the very roughest workmanship commensurate with anything remotely approaching safety, the man who went out of his way to incorporate refinements was looked upon as a kind of crank similar to the early balloonist who found it necessary to decorate his aerostat with portraits of the local and contemporary notables, and of mythological characters who were still believed to be possible arbiters in the destiny of mankind.

The various accessory, but none the less essential, fittings were made of anything which came to hand, but prominent in the jumble of makeshifts one was always sure of finding a well made steering-wheel, and in nineteen times out of twenty a close examination would prove it to be the work of Dover, Ltd., of Northampton. Incorporating both refinement and strength these Dover wheels rapidly were recognised as the correct article for each and every aeroplane, chiefly because of the ribbed grip, which ensures a steady hold without fear of blisters or other discomforts, and the Dover wheel has held its own ever since.

The firm manufacture various other articles of interest, direct and indirect, to the aeronautical world, including waterproof covers for Bowden Wires, Exonite Lever Knobs and special transparent shields for windows.

Those interested are invited to write for an illustrated leaflet describing the various other articles which can be supplied. The address of the London house is 35, Hatton Garden, E.C.

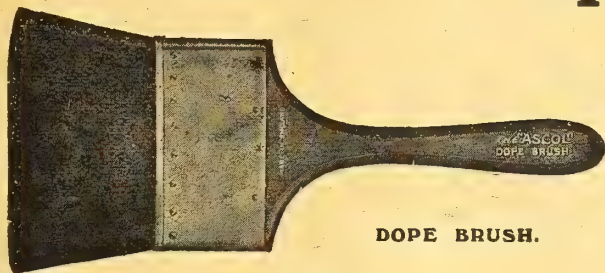
## A WALL CALENDAR.

In these days of restricted paper supplies the large lettered wall calendar which he who runs may read, and which was so popular a few years ago, has almost disappeared, but a few fortunate firms seem to have secured a limited supply for distribution to their customers. Among them is J. Freeman, Sons, and Co., Ltd., Garratt Lane, Wandsworth, S.W.18, who announce that although the supply is limited this year, a few copies have been reserved expressly for aircraft firms, and those interested are invited to apply for a copy.



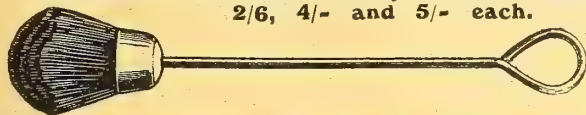


# "Ascol" Specialities!



DOPE BRUSH.

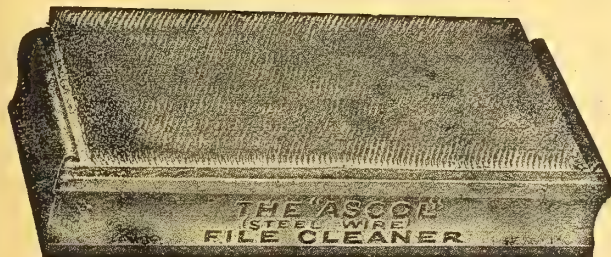
Specially designed after a careful study of the requirements of Aircraft Manufacturers. They are made of the finest bristles which are firmly set in the handles. 2/6, 4/- and 5/- each.



ENGINE BRUSH, 8/6 and 9/6 per doz.



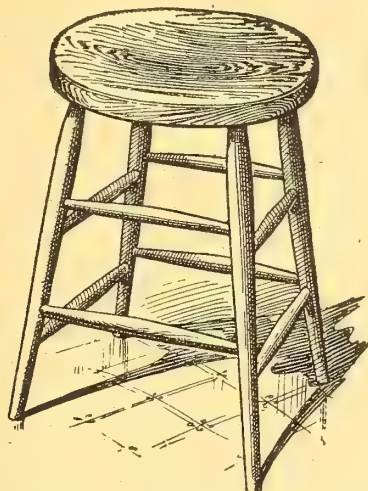
MOP BRUSH. 4/2 per doz.



"ASCOL" FILE CLEANERS.

The bristles are made of steel wire, and the effect of its use, particularly on files which have been used for soft metals, is almost equal to re-cutting, 8/6 per doz.

For full particulars of these and other items see "Aircraft Supplies," our Fortnightly House Journal. Sent free to the Aircraft Industry on application on business stationery. Illustrated Leaflets dealing with these and other "Ascol" Specialties are now in course of preparation, and will be sent free upon request.



FACTORY STOOLS (Wood) 24in. high. 6/6 each.

Write for a c.p. of illustrated Leaflets dealing with these and other "Ascol" Specialities.



"ASCOL" MICROMETERS.

Have the following important qualities:— accuracy, legibility, adjustability, simplicity, strength and value. 30/- and 32/6 each.

## THE AIRCRAFT SUPPLIES COMPANY LTD

CONTRACTORS TO THE AIR BOARD.

Head Offices, Showrooms, and Stores:

ASCOL HOUSE, 125, LONG ACRE, LONDON, W.C. 2.

Representatives in Birmingham, Manchester, Leeds, Belfast, Northern Counties and Scotland, South Coast, and the London District.

Managing Director:  
G. H. MANSFIELD.

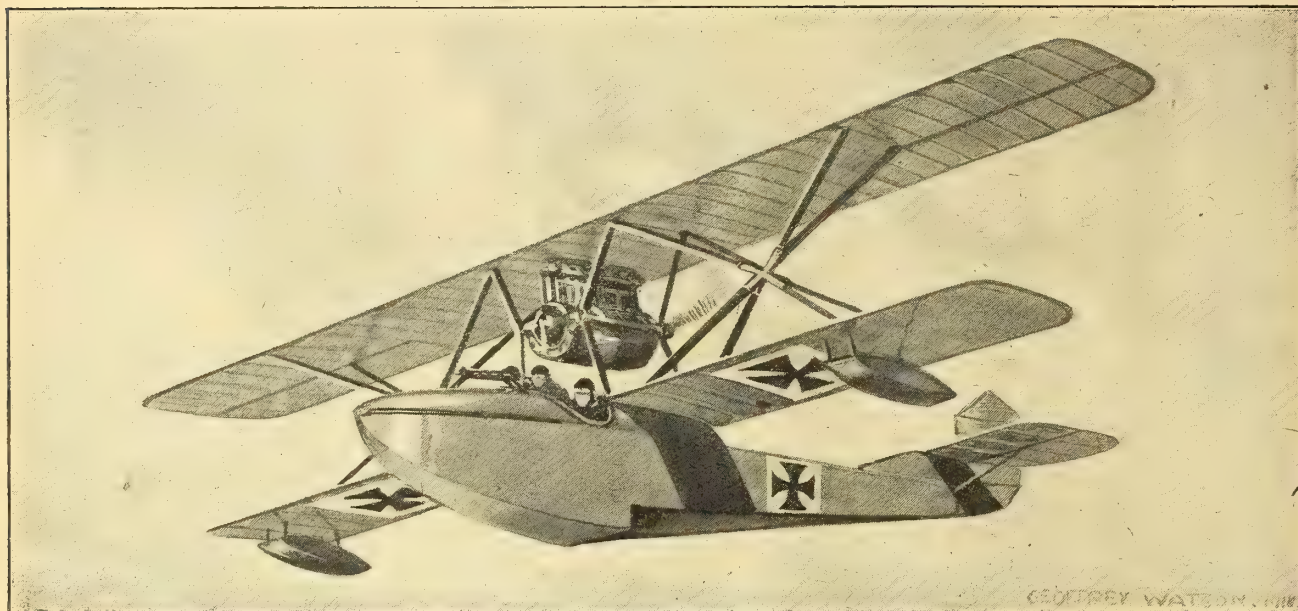
Works:  
Little James St.  
London, W.C.1. (Private Branch Exchange.)

Telephone:  
Gerrard 276.  
"Upcast, Rand,"  
London.

Telegrams:  
"Upcast, Rand,"  
London.





**AUSTRIAN FLYING BOATS.****AN AUSTRIAN FLYING BOAT. The Ago Two-Seater Seagoing Fighter.**

The following extracts, describing the Austrian Lohner and Ago flying-boats, are reprinted, with acknowledgments, from "Aerial Age Weekly," New York, Dec. 24th, 1917.

**1—THE AGO SEA PURSUIT BIPLANE.**

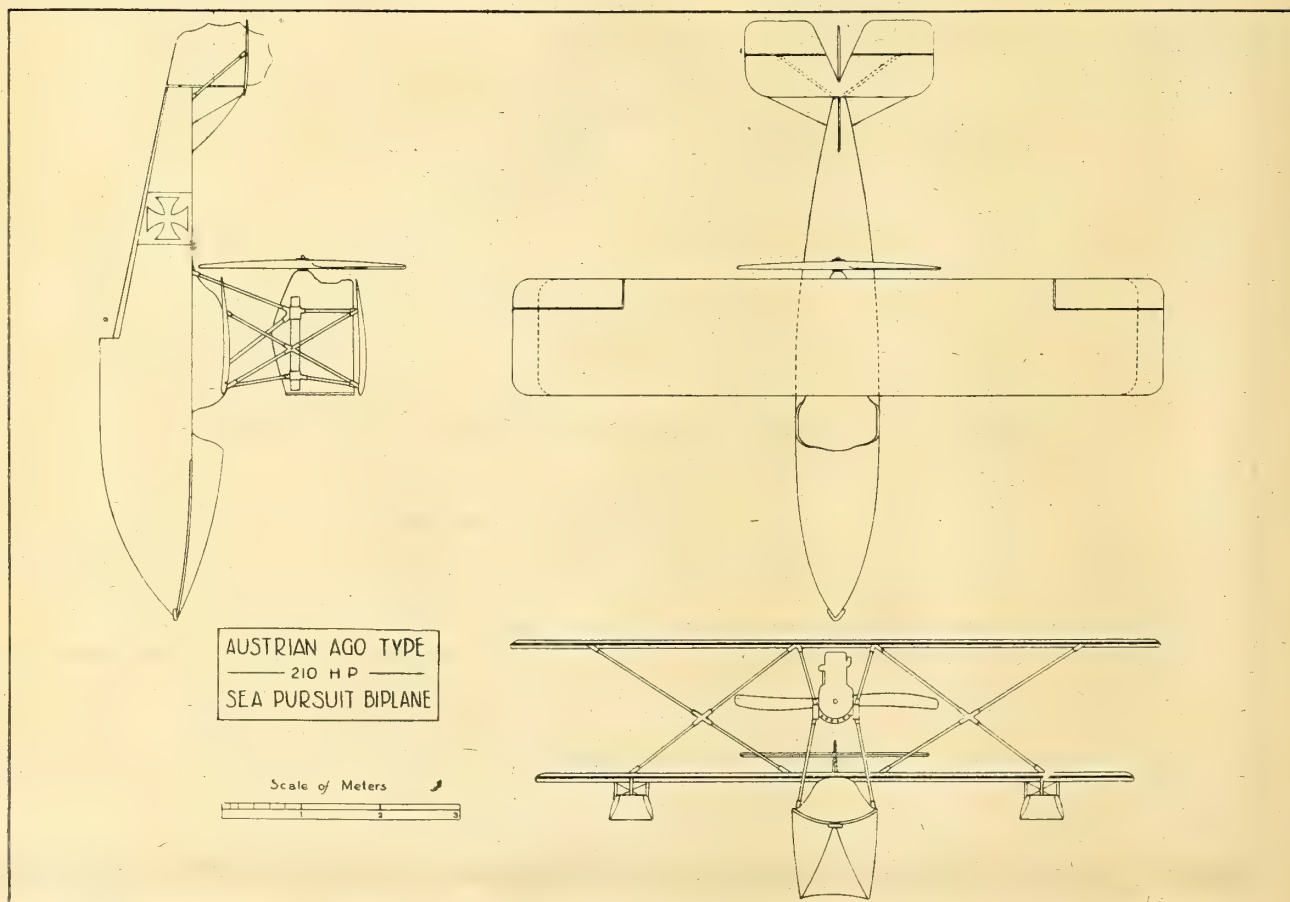
In its general lines this machine does not differ much from all the flying boats of the Ago type. It does offer, however, features that are original and worthy of mention. Most striking is the structure of the wing cell in which no wires are employed.

The wing cell may be considered as consisting of two cross-networks, each made up of a front spar and a rear spar and of adjacent struts in inclined planes connecting the spars, all converging toward the centre of the "star" located midway between

upper and lower wings. The struts are of polished steel tubing with a fairing of laminated wood less than one mm. thick, providing a good streamlining effect.

**GENERAL DIMENSIONS.**

Span, upper plane .....	8.00 m.
Span, lower plane .....	7.38 m.
Chord, both planes .....	1.50 m.
Gap between planes .....	1.65 m.
Length overall .....	7.62 m.
Length of hull .....	6.50 m.
Maximum width of hull .....	1.00 m.
Motor, Warschalowski .....	218 h.p.
Propeller, diameter .....	2.72 m.





# EMAILLITE

NON-POISONOUS

AEROPLANE DOPE.

*THE ORIGINAL AND STILL THE PREMIER.*

AS  
TIGHT



*Trade Mark.*

AS  
A DRUM.

THE BRITISH EMAILLITE CO., LTD.,

*Contractors to the Air Board.*

Registered Offices:

30, Regent Street, Piccadilly, S.W.1.

Wire—"Ridleyppren, Piccy, London."

" Phone—280 Gerrard

Works

5, Hythe Road, Cumberland Park,  
Willesden Junction, N.W.10.

Telephone—Willesden 2346 & 2347.



Control cables to the ailerons pass close to the struts of the turret and lead to the upper plane. Each aileron is about 1.40 m. long and 0.40 m. wide.

The construction solution of the hull, the great care with which the exposed parts have been shaped, the complete covering of cables and control wires, and the streamline shape of the hull, all show a desire to cut down head resistances as much as possible. Similar care is shown in all details of construction to reduce to a minimum the weight of the machine without detriment to its strength.

The hull is 6½ m. long; width at the step, 0.95 m.; maximum width, 1 m.; distance from bow to step, 3.45 m.; height of step, 0.16 m. The shape of the body with the necessary lining at the bow and because of a careful laying of the side and bottom plating, approaches very much the shape of a solid body of fairly good streamline form.

The wing floats are spaced 5 m. apart. They are of streamline section, with flat sides, attached to the planes by means of one forward strut and two rear struts, with cross wire bracing between the struts.

The empennage is 2.38 m. in span, sustained in front by a vertical fin of very thin laminated wood, by two stays and two wire cables.

Control wires of the rudder and elevators run through the fin. The rudder is 1.40 m. high by 0.80 m. wide.

The data given out concerning the motor is as follows:—  
"Motor: Hiero Flugmotor, Osterr; Ind. Werke Warchalowski, Eissler and Co.; A-G 6 cylinders; type, HN1096. It develops 218 h.p. at 1,400 r.p.m. Weight, 314 kilos. It is equipped with Bosch magnetos and small starting magnetos. Propeller: 200 h.p. Hiero 6 cylinder; diameter, 2.72 m.; pitch, 2.25-2.40."

#### 2—THE LOHNER FLYING-BOAT.

This is an enlarged machine of the Lohner type, retaining the swept back wings, which are typical of the Lohner aeroplanes.

There are six steel struts on either side and, two by two, are connected in transverse planes with steel tubes of 40 mm. outside

diameter. The distance between two struts in the direction of the brace is 1.30 m., and in the direction of the spar 2.17 m.

#### GENERAL DIMENSIONS.

Span, upper plane .....	9.70 m.
Span, lower plane .....	7.20 m.
Chord, upper plane .....	2.70 m.
Chord, lower plane .....	2.20 m.
Hull, maximum length .....	12.50 m.
Bomb carrying capacity .....	400 Kg.
Motor, Austro-Daimler .....	300 h.p.

In form the ailerons are trapezoidal, like that of the Italian Lohner machines. Length of ailerons, 3.47 m.; mean width, 0.90 m.

Dimensions of the empennage: Length of horizontal stabiliser or tail-plane, 4.74 m.; width, 1.27 m. Length of tail-flaps or elevators, 4.74 m.; width, 0.87 m. The vertical rudder differs from that of the old Lohner machines in that there is a small balancing area forward of the pivot.

The principal dimensions of the hull are: Maximum width, 1.50 m.; maximum length, 12.50 m.; maximum height, 1.20 m.; step, 0.25 m.

The body has two seats side by side and one in front, upon which is mounted a machine-gun arranged to be movable and fired in any direction. Beside the pilot, next to the observer, there is also a machine-gun arranged on a movable tube inside the casing.

The turret is armoured. There are two vertical pieces of wood, with a circular profile notch fastened to the floats under the wings. It may be that these are used to drop large bombs, but no discovery has been made which would show how they are secured in them. Several hooks for small bombs were found.

The lateral or wing-floats, instead of being hemispherical in shape, have a bow with good streamlines, which plough on the water surface like the prow of a ship. Each is 88 cm. wide and 181 cm. long.

The engine, an Austro-Daimler, has 12 cylinders arranged in a V. It is rated at 300 h.p.

## THE USE OF BRITISH MATERIAL.

The following letter is worthy of attention:—

Sir,—We are much obliged to you for inserting our letter in your issue of Jan. 23rd. You were good enough to head it, "Future of Aircraft Production," but perhaps you will pardon us for suggesting that our remarks were directed to the immediate future.

We are particularly anxious to see a rapid production between now and the Spring, that is why we suggested the use of already existing British business premises and readily available British woods, in case the monster programme of our American Allies does not materialise so quickly as they themselves anticipate.

Since we last wrote we notice that the relief which we were expecting from them on Feb. 1st has been deferred until March 1st; we are pretty well right in saying that certain of their programmes have proved almost a fiasco; and we have little doubt that other delays in the manufacture of essential war equipment are known to our Ministry of Munitions.

These remarks are made not in the least in any spirit of criticism against our cousins over the water, but merely to point out that we must not rely upon their enthusiasm to work miracles, which our own three years' experience of the realities of war-work has shown to be scarcely possible.

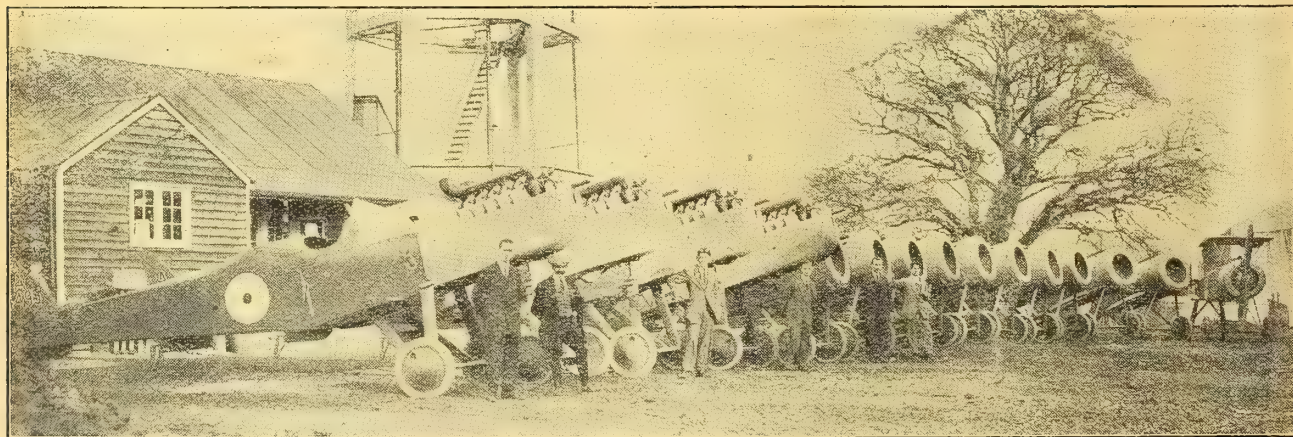
Germany relies upon her own factories and her own timbers, and we are prepared to back our own managers and workmen and timbers against Germans any day. A German may be a methodical plodder, but he has little inventive faculty, and it is certain that his native raw materials, in the shape of men and timber, are not so good as ours.

Wood for wood, English timber is superior in fibre to the German grown; English ash is better than German, English oak than German oak, English beech than German beech, and so on.

With regard to the *Système Globale*, it is quite possible that after the war giant factories, very carefully planned in positions adjacent to flying grounds, and easily accessible to raw material and labour, may produce commercial aircraft as properly and cheaply as the Ford cars are produced nowadays, but, for the needs of the moment, we suggest it is better to use the premises, labour, wood, etc., which lie ready to our hand.

If a manufacturing concern is divided into half a dozen small factories, two doing wood work, two doing metal work, and two assembling, then a chance bomb from a raider might knock out one section, but obviously cannot stop the output of the firm as a whole.

(Signed) For and on behalf of Thames Aviation Works,  
J. READ BURTON, Director.



OUTPUT: Some of the Products of the Standard Motor Co., Ltd.





## Behind 'Triplex' Safety Glass

—absolute security and maximum safety is assured. "Triplex" should be insisted upon for Goggles, Windows, Windscreens, Aeroplane Observation Panels, Instrument Covers, etc. It cannot possibly "fly" or splinter, no matter how badly smashed it may become. Think what this means! Fit "Triplex" now—before the accident. Follow the example of leading flying men and motorists. There is only *one* "Triplex"; it is perfectly safe under all conditions—bullet and burglar-proof. Learn more about "Triplex." Catalogue mailed free.

**THE 'TRIPLEX' SAFETY GLASS Co., Ltd.,**  
1, Albemarle Street, Piccadilly, London, W.1.

### 'A Pilot writes :—

"You will be pleased to hear that 'Triplex' saved my eyes from being badly cut, and will be also interested to learn that the 'Triplex' Wind-screen was unbroken although the immediate surroundings were battered."

(EXTRACT FROM LETTER).

**Contractors to  
H.M. Admiralty  
and War Office.**

### Telling Testimony.

"The 'Triplex' Goggles have undoubtedly saved my eyesight, as I fell a distance of 350 feet while on duty in France. The accident was caused by the collision of two machines in a snowstorm . . . both pilot and observer in one machine being killed, and the observer in the other, I being the only survivor."

(EXTRACT FROM LETTER).



**WOODSIDE ENGINEERING COMPANY, LTD.,  
POSSILPARK, GLASGOW.**

---

# **AEROPLANE TIERODS**

: IN :

**STREAMLINE AND ROUND SECTIONS**

**COMPLETE WITH**

**UNIVERSAL OR FORK JOINTS**

**LARGE STOCKS.**

---

**PROMPT DELIVERY.**

---

**Telephones.**

**WORKS: 1495 Douglas (2 lines.)**

**OFFICE: 5456 Central (3 lines.)**

(Private Branch Exchange.)

**Telegrams: "FUSELAGE," GLASGOW.**

**Registered Office**

**50 WELLINGTON STREET,  
GLASGOW.**



NON-POISONOUS  
DOPE

TITANINE



THE  
BRITISH AEROPLANE  
VARNISH CO., LTD.  
166, PICCADILLY, LONDON, W.1

Telephone : : CHERRARD 2312.  
Telegrams : TETRAFREE, PAGOY, LONDON.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# STEEL TUBING IN STOCK

TRADE MARK.



MEANS LONG LIFE

Get your Requirements at once.  
We have a very large quantity of  
 $\frac{3}{8}$  in. outside diameter by 10, 11,  
12, 13, 14 and 15, gauge, besides  
other small diameters.

This stock will not last long, and we  
advise buyers to send instructions  
immediately.

**The Steel Tube, Tubular Spanner & Presswork People.**

Telegrams:

"Accles,  
Oldbury."A.B.C. Code,  
5th Edition.

Telephones:

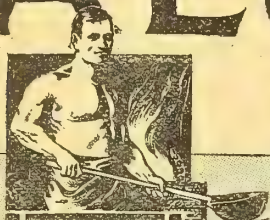
Oldbury, 111.

(4 Lines.)

OLDBURY,

BIRMINGHAM.

# ALUMINIUM CASTINGS



**SAND or DIE**  
of Every Description  
2 HP to 600 HP

Telephones  
3846  
CITY  
4879  
CENTRAL

**CHILL CASTINGS for AEROPLANES A SPECIALITY**  
Best Metal. Good Castings. Quick Deliveries  
*Repairs to Aluminium Crank Cases, Gear Boxes etc. by Special Process*

Telegrams  
KRANKASES  
ISLINO  
LONDON

## R.W.COAN

*The Aluminium Foundry*  
**219, GOSWELL ROAD,  
LONDON,  
E.C**

**COAN  
CASTS  
CLEAN  
CRANK  
CASES**

**Contractor  
to  
H.M. GOVERNMENT**

**NOW IN A POSITION TO EXECUTE ORDERS.**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# The "Guardian Angel" Parachutes



## AIR CASUALTIES AND THEIR CURE.

### EXTRACT FROM BRITISH AIR REPORT, G.H.Q.

—25th Jan., 1918.

" \* \* \* Two of our machines are missing, including one which was seen to collide with a German machine during combat."

—*The Times*, 26th Jan., 1918.

A "Guardian Angel" Parachute would give an aviator, charging an enemy machine, a sporting chance of his life, which he should have, and is all he would ask for.

### AIRMAN'S 3,000 FEET FALL.—Aeroplane Flies Alone.

"While flying in the Midlands yesterday afternoon Second-Lieut Harold Griffiths Nelson was killed by falling from his machine at a height of 3,000 feet.

"It is supposed that the belt attaching him to the machine came unfastened. The aeroplane continued its flight and came down a few fields away."—*The Globe*, 23rd Jan. 1918.

Had this aviator been supplied with the "Guardian Angel" instantly releasable Harness, which holds a man securely into his machine, this accident and the loss of the machine would not have happened. It has cost the country the loss of a man, WHO IS WANTED, the cost of his training, and the cost of the aeroplane; say, about £8,000.

Many Aviators object to the pressure of the Service holding-in belt, and fly with it unfastened. It was probably so in this case. The "Guardian Angel" Harness is adjustable to the maximum of slackness anyone could desire; and yet, even thus, it is impossible for a wounded or even an insensible man to fall out of it, either from an aeroplane, or when dropping in the Parachute.

### A SPINNING DIVE FROM 5,000 FEET.

#### YOUNG R.F.C. OFFICER'S TERRIBLE DEATH.

"An inquest was held at Bromley, yesterday, on Captain Evelyn Horace Guy Sharples, of the Royal Flying Corps, who was killed in a flying accident on Saturday. Deceased was 19 years of age, and the son of the Rev. H. S. Sharples, of Finghall Rectory, Constable Barton, Yorkshire.

Evidence was given that Captain Sharples was a skilful pilot. He did several evolutions, and these were carried out in accordance with instructions. They were performed for training purposes, and not for officers' amusement, as was sometimes suggested.

Other evidence was to the effect that the machine was about 4,000 to 5,000 feet up, flying on even keel. Suddenly it banked to the left, and started spinning nose downwards. Then it flattened out, and a moment later a dark object moved from the machine and the wings collapsed upwards like a butterfly. The machine crashed on to some houses, going through the roofs of two of them. Deceased was found buried by the wreckage in the front garden of one of the houses.

A verdict of "death by misadventure" was returned."

—*Birmingham Post*, 22nd Jan., 1918.

Without doubt this officer's life would have been saved if his machine had been fitted with the "Guardian Angel" equipment. All the way down from 5,000 ft. he would have opportunities of getting off, and the best when his machine flattened out. With such a lengthy drop it would have become perfectly clear to his judgment as to whether he was not only justified in diving off with his parachute, but as to whether it had not become his imperative duty to make the drop. It is the accumulated experience of the Aviator which should be saved—not the machine.

RELIABILITY—First.

RELIABILITY—Second.

RELIABILITY—ALL THE TIME.

## E. R. CALTHROP'S AERIAL PATENTS, LTD.

ELDON STREET HOUSE, ELDON STREET, LONDON, E.C.2.

Telephones (2 lines): London Wall 3266 and 3267.

Telegraphic and Cable Address: "Savemalivo-Ave-London."

Contractors to H.M. Admiralty, War Office and Foreign Governments.

# The BRITISH CAUDRON

## CO., LTD.

SOLE BUILDING AND SELLING RIGHTS FOR

### Caudron Aeroplanes and Hydro-Aeroplanes

FOR

### THE BRITISH EMPIRE AND DEPENDENCIES

Head Office and Works:

BROADWAY, CRICKLEWOOD, N.W.2.

Cable and Telegraphic Address: "CAUDROPLAN, CRICKLE, LONDON."

Phone: 4647  
4648 HAMPSTEAD

Scottish Factory and Aerodrome:

ALLOA.

Cable and Telegraphic Address: "CAUDROPLAN, ALLOA."

Phone: 52

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



Telephone :—1992 HAMMERSMITH (3 lines).

# The DAVIDSON Aviation Co Ltd

**CONTRACTORS TO H.M. GOVERNMENT.**

Designers and Manufacturers of all Types  
of Aircraft for Overland and Oversea  
- - Purposes, Flying Boats, etc. - -

Managing Director:

W. EWART CHESTER, F.R.G.S.


Consulting Engineer:

H. B. MOLESWORTH, M.I.C.E.

Aviation Works & Offices - 229-231, Hammersmith Road, W.

Engineering Works - King Street, Hammersmith.

Aircrew Works - Ravenscourt Park, W.

# Non Flamm Celluloid

Phone Central 1306 & 1307

Telegrams "GREENBERG" LONDON

**GREENHILL & SONS**  
8 WATER LANE LUDGATE HILL  
LONDON. E.C. 4



# ALUMINIUM CASTINGS

OF EVERY DESCRIPTION.

We make a  
Speciality  
of  
Aeronautical  
and  
Automobile  
Work.

We are making many thousands of **Aluminium Die Castings** weekly under the celebrated **Cothlas** process—in many cases **entirely eliminating** machining operations, and we hold the sole manufacturing rights in the British Empire for this process.

Chemical and Physical tests are made on our own premises, and our **Castings**, both **Sand** and **Die**, are produced under the most up-to-date and scientific methods.

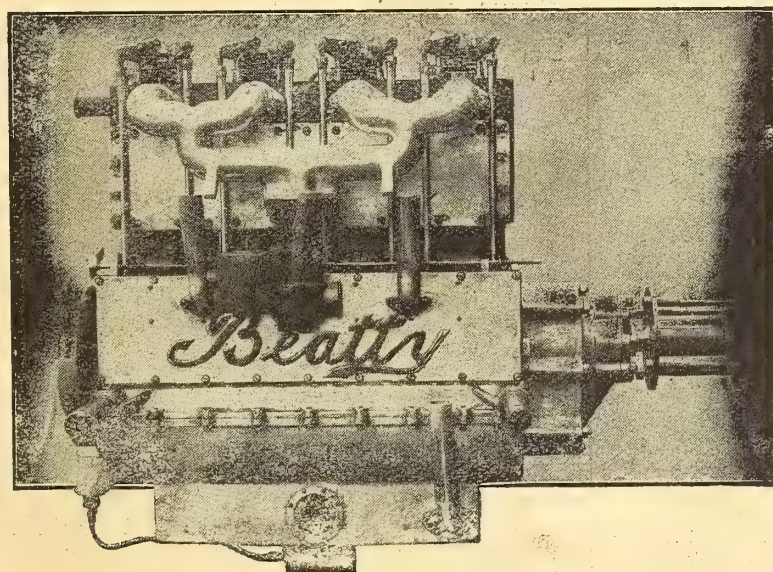
Sole makers of the **Birmal Aluminium Pistons**, thousands of which are running to-day in a highly satisfactory manner under the most severe conditions.

Highest  
Class  
Castings to  
Government  
Specifications.  
Prompt  
Delivery.

**BIRMINGHAM ALUMINIUM CASTING (1903) CO., LD.**  
**Cambridge Street Works, BIRMINGHAM.**

## The Beatty Monobloc Aero Engine

H.P. = 60.  
R.P.M. = 1800  
Engine Shaft.  
Prop. speed =  
1200 R.P.M.  
Weight = 225 lbs



Petrol  
Consumption  
4.28 galls. per  
hour.

Oil  
Consumption  
.18 galls. per  
hour.

*Specially Designed and Developed for School Work.*

FULL PARTICULARS **The Beatty School of Flying Ltd.** LONDON AERODROME  
Telephone . . . . Kingsbury 138.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





# The Aeroplane

## Acceptance and Experimental Flights—

The Prodig Isaac Aviation Co. "Aeromonia, Piccy, London. Gerrard 278 (2 lines).

## Acetylene Welding Plant—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.  
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

## Aeroplane Manufacturers—

Aircraft Manufacturing Co., Ltd., Hendon. "Airmanship, Hyde, London. Kingsbury 180.

Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle-on-Tyne. "Armstrong Aviation, Newcastle-on-Tyne." Gosforth 500.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds. Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

British & Colonial Aeroplane Co., Ltd. (The Bristol Co.), Filton, Bristol. "Aviation, Bristol." Bristol 3906.

British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudronplan, Cricklewood, London." Hampstead 5531.

Central Aircraft Co., Palmerston Works, High Road, Kilburn, N.W.6. "Aviduction, Phone, London." Hampstead 4403 and 4404.

Davidson Aviation Co., Ltd., Hammersmith, W.6. Hammersmith 1144-1145.

Eastbourne Aviation Co., Ltd., Eastbourne. "Aircraft, Eastbourne." Eastbourne 1176.

Grahame-White Aviation Co., Ltd., London Aerodrome, Hendon. "Volplane, Hyde, London." Kingsbury 120.

Handley Page, Ltd., 110, Cricklewood Lane, N.W.2. "Hydrophid, Crickle, London." Hampstead 7420.

Hooper & Co., Ltd., 54, St. James St. Piccadilly, London, S.W. "Sociable, St. James, London." Regent 912.

Mann, Egerton & Co., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Martinsyde, Ltd., Brooklands, Byfleet. "Martinsyde, Weybridge." Working 331; Byfleet 171.

National Aircraft Co., Ltd., 15, Hackney Road, N.E.2. London Wall 6725.

"Nieuport" & General Aircraft Co., Cricklewood, London, N.W.2. "Nieu Scout, Crickle, London." Willesden 2455.

Norman-Thompson Flight Co., Ltd., Bognor. "Soaring, Bognor." Bognor 48.

The Regent Carriage Co., Ltd., 126/132, New King's Road, Fulham, S.W.6. "Carbodis, London." Putney 2240-2241.

Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester." City 8530-8531, Manchester.

Saunders, S. E., Ltd., East Cowes, I.O.W. "Consuta, East Cowes." Cowes 193.

Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tested, Phone, London." Regent 378.

Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston." Kingston 744.

Standard Aircraft Manufacturing Co., Effingham House, Arundel Street, W.C.2. "Gunsgrush, Estrand, London." City 89.

Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickerfyta, Knights, London." Kensington 6810.

Waring & Gillow, Ltd., Hammersmith. "Warisen, Ox, London." Museum 5000.

Westland Aircraft Works, Yeovil. "Aircraft, Yeovil." Yeovil 129.

White, J. Samuel & Co., Ltd., East Cowes. "White, East Cowes." Cowes 3.

Whitehead Aircraft (1917), Ltd., Richmond Surrey. "Whitecraft, Richmond, Surrey." Richmond 1865.

Wycombe Aircraft Constructors, Ltd., High Wycombe, Bucks. "Aircraft, High Wycombe." High Wycombe 84.

## Airships—

Airships, Ltd., High Street, Merton. Short Bros., Rochester, Eastchurch, and Whitehall House, S.W. "Tested, Phone, London." Regent 378.

## Aluminium Castings (Sand & Die)

Coan, R. W., 219, Goswell Road, London, E.C.1. "Krankases, Isling, London." City 846.

## Bearings (Etonia Cast Phosphor Bronze)—

Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds." Central 3927.

## Brass Sheets for Tipping Propellers—

Pritt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fen, London." Avenue 995, 996, and 7006.

## Buildings—

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

Palmer, T. W., & Co., Church Road, Merton Abbey, Surrey. Wimbledon 1313.

Ruery Owen & Co., Darlaston, South Staffs. The Wilfley Co., Ltd., Salisbury House, London Wall, E.C.2. "Wrathless, Phone, City 268-2.

## Cable Coverings and Cable Controls—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Capstan Work—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Carburettors—

Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.1. Victoria 4670.

## Casein—

Nieuwhof, Surie & Co., Ltd., 5, Lloyds Avenue, London, E.C.3. "Surico don, Fen London." Avenue 34 and 35.

## Castings—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Castings (Aluminium, Brass, Bronze, Machine or Rough)—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Celluloid (Non-Flam.)—

Greenhill & Sons, 8, Water Lane, E.C. "Greenberg, London." Central 1306-7.

London Label Co., Beckton Road, E.16. "Londabel, Canning, London." East 1300.

## Clothing—

Burberry's, Ltd., Haymarket, S.W.1. Regent 2165.

Dunhill's, Ltd., Euston Road, N.W.1. "Dunsend, London." North 3405-6.

## Component Parts—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines).

B. D. V. Aircraft Spares, Syon Chambers, 16a, Kew Road, Richmond, Surrey. "Aeros, Richmond." Richmond 1681.

Central Aircraft Co., Palmerston Works, High Rd., Kilburn, N.W.6. Hampstead, 4728.

"Aviduction, Phone, London." Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

The Aircraft Construction Co., Harley Works, Beckton Road, E.16. "Aerocracos, Canning, London." East 1300.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

## Cords, Tapes, and Threads—

MacLennan, J., & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.

## Dopes—

British Aeroplane Varnish Co., Ltd., 166, Piccadilly, W.1. "Tetrafree, Piccy, London." Gerrard, 2312.

British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellutate, London." Regent 4046.

The British Emallite Co., Ltd., 30, Regent Street, S.W.1. "Ridleyren, Piccy, London." Gerrard 280.

Celton, Ltd., Broad Street House, New Broad Street, E.C.2. "Ajawb, London." London Wall 5359-3622.

Clark, Robert, Ingham & Co., Ltd., Walter House, Bedford Street, Strand, W.C. "Pearline, Westrand." Regent 3923.

## Electrical Accessories—

Belling & Co., Derby Road Works, Montague Road, Upper Edmonton, N.18. "Belling, Edmonton." Tottenham 1084.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207, London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Eusroad, London." Museum 70.

Premier Electric Heaters, Ltd., 258, 259, and 360, Bradford Street, Birmingham. "Fahrenheit, Birmingham." Midland 681.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

E. Kalker & Co., Coventry. "Kalker, Coventry." Coventry 248.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207, London Wall 1564.

## Electric Lighting and Power—

E. Stanley Fardon, A.M.I.E.E., 67, Mosley Street, Manchester. Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207, London Wall 1564.

## Engines and Parts—

Allen, W. H., Son & Co., Ltd., Queen's Engineering Works, Bedford. "Pump, Bedford." Bedford No. 1.

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

The Beatty School of Flying, Ltd., The Broadway, Cricklewood, N.W.2. Hampstead 3000.

Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London." Gerrard 238.

Dudbridge Iron Works, Ltd. (Salmon), 87, Victoria Street, London S.W.1. "Aero-flight, Vic, London." Vic 7026.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

Gordon Watney & Co., Ltd., Weybridge. "Mercedés, Weybridge." Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham. Richmond 1293.

Gwynnes, Ltd., Hammersmith Iron Works, Hammersmith, W. "Gwynne, Hammersmith." Hammersmith 1910.

Napier & Son, D., Ltd., 14, New Burlington Street, London, W., and at Acton, W. "Nitriker, London." Gerrard 826.

Robertson, J. H., & Co., 1, Albemarle Street, London, W.1. Regent 3906.

Rolls-Royce, Ltd., 14 and 15, Conduit St., W.1. "Rolhead, London." Gerrard 1654-5-6.

The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. Regent 1181.

Stürtevant, B. F., Co., Ltd., Hyde Park, Boston, U.S.A. Wolverhampton 885.

Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorfield, Wolverhampton." Wolverhampton 885.

The Gnome & Le Rhône Engine Co., Ltd., 47, Victoria Street, S.W. "Elevenfold, London." Walthamstow 408 (2 lines).

## Flare Lights—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

## Flexible Shafts—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Flying Schools—

Bournemouth Aviation Co., Ltd., Talbot Village, Bournemouth. "Etches, Winton." Bournemouth 1160.

Cambridge School of Flying and Aerodrome Co., 308, St. Andrews St., Cambridge. "Carbon, Cambridge." Cambridge 5 and 1086.

## Furniture (Office)—

Cooke's (Finsbury), Ltd., Finsbury Pavement House, London, E.C.2. London Wall 573 and 6179.

## Galvanising—

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

The Rustless Iron (Cowper Coles Process), Ltd., 1, French St., Sunbury-on-Thames, Middlesex. Sunbury 37.

## Gears—

Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham." East 407.

## Glue—

Central Chemicals, Ltd., 283, West End Lane, London, N.W.6. "Entramical, Westhamp, London." East 407.

Improved Liquid Glues Co., Ltd., Gt. Hermitage Street, E. (Croid). "Exeroiden, Wapp, London." Avenue 3178.

Mendinge Co., 8, Arthur Street, E.C. Bank 5873.

Oldrovi, Wm., & Sons, Ltd., 9, Mincing Lane, E.C.3.

## Coggles—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlyres, Piccy, London." Regent 1340.

## Heating and Ventilating—

Chas. P. Kinnell & Co., Ltd., 65 & 65a Southwark Street, London, S.E.1. "Kinnell, London." Hop 372 (2 lines).

## Hollow Spars—

McGruer Bentwood Hollow Spar Co., Commercial Wharf, Lambeth, S.E. "Gabrielson, Watloo, London." Hop 718.

Robert Young's Construction Co., Ltd., Canonbury Works, Canonbury Street, Essex Rd., London, N.1.

## Instruments—

British Wright Co., Ltd., 33, Chancery Lane, W.C.2. Holborn 1308.

## Instruments (Scientific, Altimeters, etc.)—

The Cambridge Scientific Instrument Co., Ltd., Cambridge. "Instrument, Cambridge." Cambridge 642.

Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, Phone, London." Walthamstow 180.



# Buyers' Guide.



## Machine Tools—

Brewster & Co., 11, Queen Victoria Street, E.C.4. "Circumfuse, Cannon, London." City 768.

## Magneto Driving Pieces—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Magnetos—

The M.L. Magneto Syndicate, Ltd., Victoria Works, Coventry. "Corlton, Coventry." Coventry 1008-1009.

The British Lighting & Ignition Co., Ltd., 204, Tottenham Court Road, W.1. "Vicks-mag, Phone, London." Museum 430.

Ericsson Manufacturing Co. (Berling Magneto), Buffalo, N.Y., U.S.A.

## Metal Manufacturers—

Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 42-43.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

## Metals in General—

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Pritt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fen, London." Avenue 905, 606, and 7006.

Samuel Mercer & Co., 198, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

## Metal Parts and Fittings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

Aircraft Supplies Co., Ltd., Ascol House, 125, Long Acre, W.C.2. "Upcast, Rand, London." Gerrard 276 (2 lines).

Arnott & Harrison, Ltd., Hyde Road, Willesden Junction. Willesden 2207.

Bayliss, Jones & Bayliss, Ltd., Wolverhampton. (Bolts and Nuts.) "Bayliss, Wolverhampton." Wolverhampton 1041.

The Birmingham Guild, Ltd., 45, St. Charles Street, Birmingham. "Handicraft." Central 3705.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

The British Gold Shell Ring Co., Ltd., Inverness Road, Hounslow, London. "Golshel, Hounslow." Hounslow 254.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Euston, London." Museum 70.

Mountford, Fredk., Ltd., Fremo Works, Lifford, Birmingham. "Fremo, Birmingham." Kings Norton 261.

Robertson, J. H., & Co., 1, Albemarle Street, London, W.1. Regent 3906.

Rubery, Owen, & Co., Darlaston South Staffs. Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66.

The Pulvo Engineering Co., Ltd., 10, to 16, Dane Street, High Holborn, London, W.C.1. "Pulvipult, Phone, London." Holborn 410.

The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. Regent 1181.

The Aircraft Construction Co., Harley Works, Beckton Resd., E.16. "Aeracracons, Canning, London." East 1300.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

Thomson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston." Bilston 10.

Wooler Engineering Co., Ltd., Old Oak Common Lane, Willesden Junction, N.W.10.

## Metal Shearing Tools—

Montgomery, Smith, & Co., Ltd., Tangent Works, Keynsham, near Bristol. "Ingenuity, Salford." Keynsham 21.

## Metal Spinnings—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Metric Bolts—

Cashmore Bros., Zota Works, Hildreth Street, Balham, S.W. Rubery Owen & Co., Darlaston, South Staffs.

## Miscellaneous—

Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast." Belfast 4033-4034-4035.

Anti-Glare Glass Co., Ltd., 30, Wigmore Street, "Wingateise, London." Mayfair 2353.

Bowden Wire, Ltd., Willesden Junction, "Bowirelim, Harles, London." Willesden 2400 (3 lines).

British Metal (Kingston), Ltd., Kingston-on-Thames.

Brown Bros., Ltd., Great Eastern Street, E.C.1. "Imbrowned, Bethroad, London." London Wall 6300.

Herbert Frood Co., Ltd., Chapel-en-le-Frith. "Froolobake, Birmingham." Central 793.

Endolithic Manufacturing Co., Ltd., 61½, Fore Street, London, E.C.2. Labels in Metal, Ivory, Ivorine, etc.

Glasso Manufacturing Co., Ltd., 211, City Road, E.C. City 9558.

London Label Co., Ltd., Harley Works, Beckton Road, E.16. "Nonflamoid," Nonflammable Celluloid. "Lonlabel, Canning, London." East 1300.

MacLennan, J., & Co., 30, Newgate Street, E.C.1., and at Glasgow. Tapes, Cords and Threads. City 3115.

## Motor Cars—

Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

Mann, Egerton & Co., Ltd., 379/381, Euston Road, London, N.W.1. "Manegecar, Euston, London." Museum 70.

Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 530 (4 lin. 3).

## Nameplates and Labels—

British Metal (Kingston), Ltd., Kingston-on-Thames.

Endolithic Manufacturing Co., Ltd., 61½, Fore Street, London, E.C.2.

The Clegg Metal Engraving Co., Chatsworth Works, Worthing. "Clegg Worthing."

## Observation Panels—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

## Parachutes—

E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemaivo, Ave, London." London Wall 3266-3267.

## Pattern Making—

Fredk. Ward, 6, 7 and 8, Allsop Street, Upper Baker Street, W. Padd 4743.

## Piston Rings—

British Chuck & Piston Ring Co., Coventry. "Rings, Coventry." Coventry 723.

## Power Presses and Dies—

Bliss, E. W., & Co., 20, Pocock Street, Blackfriars Road, London, S.E.1. "Blissdon, London." Hop 4340.

## Presswork—

Rubery Owen & Co., Darlaston, South Staffs. Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Propellers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 831.

Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames. "Ebora, Kingston." Kingston 672.

Integral Propeller Co., Ltd. "Avirop, Hyde, London." Hendon 9. Kingsbury 104.

Lang Propeller, Ltd., Weybridge. "Aerosticks, Weybridge." Weybridge 520-521.

Mann, Egerton & Co., Ltd., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Oddy, W. D., & Co., Leeds. "Aircrows, Leeds." Central 201, Leeds.

Stanley Aviation Co., 67, Kingsland Road, E.2. City 8347.

Westland Aircraft Works, Yeovil. "Aircraft, Yeovil." Yeovil 129.

## Pyrometers—

The Foster Instrument Co., Letchworth, Herts. Foster Instruments, Letchworth. Letchworth 26.

## Rigging for Aircraft—

Craddock, Geo., & Co., Ltd., Wakefield, England. "Craddock, Wakefield." Wakefield 466 (3 lines).

## Rubber Tubing & Accessories—

Hancock, James Lyne, Ltd., 266, Goswell Road, London, E.C.1. "Masticator, Isling, London." City 3811 and 3812.

## Safety Belts—

Holmes, C. H., & Son, 38, Albert Street, Manchester. "Semloh, Manchester." City 4432.

## Screw-driving Machines—

Russell Bros. (Redditch), Ltd., Littleworth, Redditch. "Inventors, Redditch." Redditch 74.

## Seaplane Manufacturers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

Mann, Egerton & Co., Ltd., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

The Norman Thompson Flight Co., Ltd., Mid-dieton, Bognor. "Soaring, Bognor." Bognor 48.

Short Bros., Rochester. "Seaplanes, Rochester." Chatham 627.

Supermarine Aviation Co., Ltd., Southampton. "Supermarine, Southampton." Southampton 1337.

## Searchlights and Landing

Lights—Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

## Seats for Aeroplanes—

Bowser, E., Art Cane Works, 50 Park Lane, Leeds. Central 3473.

## Shackles—

The British Gold Shell Ring Co., Ltd., Inverness Road, Hounslow. "Golshel, Hounslow." Hounslow 254.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

## Sheet Metal Pressings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

Blackburn Aeroplane and Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345.

W. H. Briscoe & Co., Ltd., 51 and 52, Park Street, Birmingham. "Brisk, Bham." Central 550.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

London Aluminium Co., Ltd., Westwood Road, Aston, Birmingham. East 497 Birmingham.

Rubery Owen & Co., Darlaston, South Staffs.

## Sheet Metal Work—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4870.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Rubery Owen & Co., Darlaston, South Staffs.

The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.

The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. Regent 1181.

Arthur Hill & Co., Silchester Road, North Kensington, W. Park 1443.

## Shock Absorbers (Elastic Cord)—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Sparking Plugs—

Lodge Sparking Plug Co., Ltd., Rugby. "Igniter, Rugby." Rugby 235.

Ripault, Leo, & Co., Ltd. (Oleo Plugs), 644, Poland Street, W.1. "Ripault, Reg, London." Gerrard 7758.

## Springs—

Dart Spring Co., West Bromwich. "Dart, West Bromwich." West Bromwich 322.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61 (3 lines).

## Stampings—

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

## Steel—

Firth, Thos., & Sons, Sheffield. "Firth, Sheffield." Sheffield 3230 to 3237.

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

Nicklin, Bernard, & Co., Birmingham. "Bernico, Birmingham." Smithwick 224.

## Steel Stamps and Markings—

John Meerloo & Sons, Cleveland Works, Cleveland Street, Mile End, E.1. "Dayhur, Phone, London." East 3331 (2 lines).

## Steel Tension Wires—

Craddock, Geo., & Co., Ltd., Wakefield, England. "Craddock, Wakefield." Wakefield 466.

## Steel Tubes for Aeroplanes—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

## Taper Pins—

Mountford, Fredk. (Birmingham), Ltd., Fremo Works, Lifford, Birmingham. "Fremo, Birmingham." King's Norton 261-262.

## Tapes and Smallwares—

Brown, Percy, & Co., 49, Newgate Street, London, E.C.1. "Ominate, Cent, London." City 4659.

MacLennan, John, & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.

James North Hardy & Son, Ltd., 54, Portland Street, Manchester. "Hardson, Manchester." Central 6471.

## Timber—

Engineering Timber Co., Ltd., 9, Victoria Street, London, S.W. "Entikosil, Vic, London." Victoria 5073, 4210.

Brown, R. F., & F. W., Wollaton Saw Mills, near Nottingham. "Brown's Saw Mills, Wollaton." Nottingham 1526.

J. Owen & Sons, Ltd., 199a, Borough High Street, S.E.1. "Bucheron, London." Hop 3811 (2 lines).

## BUYERS' GUIDE cont. on next page.











**"The Aeroplane" Buyers' Guide.—continued.****Time Recorders—**

Gledhill-Brook Time Recorders, Ltd., 26, Victoria Street, S.W.1. Victoria 1310.

**Turnbuckles—**

Rubery Owen & Co., Darlaston, South Staffs.

**Tyres and Wheels—**

The Palmer Tyre, Ltd., Shaftesbury Avenue. "Tyricord, Westcent." Gerrard 1214 (5 lines)

**Undercarriages—**

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

**Varnishes—**

The British Emailite Co., Ltd., 30, Regent Street, S.W.1. "Ridleyren, Piccy, London." Gerrard 280.  
Clark, R. Ingham & Co., Walter House, Bedford Street, Strand, W.C. "Pearline, Westrand." Regent 3923.  
Harland, W., & Son, Merton, London, S.W.19. "Harland, Wimbledon 45." Wimbledon 45 and 1395.  
Naylor Bros., Ltd., Southall, Middlesex. "Naylor, Southall." Southall 30.

**Vices—**

C. and J. Hampton, Ltd., Sheffield. "Vices, Sheffield." Attercliffe 95.

**Washers—**

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1472.  
Herbert Terry & Sons, Ltd. Redditch. "Springs, Redditch." Redditch 61.

**Watchmakers and Jewellers (Silver Models)—**

Goldsmiths' & Silversmiths' Co., Ltd., 112, Regent Street, W.1. Gerrard 9091 (3 lines).

**Welding and Cutting Plant—**

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.  
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

**Welding Repairs—**

Barinar, Ltd., 10, Poland Street, W.1. "Barinquamar, Reg. London." Gerrard 8173.  
The New Welding Co., 26, Rosebery Avenue, London, E.C.1. "Windoneeda, Holb, London." Holborn 5252.  
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

**Wind Shields—**

Auster, Ltd., 133, Long Acre, W.C. "Win-flector, London." Regent 5910.  
London Label Co., Ltd., Hadley Works, Beckton Road, E.16. "Nonflamoid" Nonin-flammable Celluloid. "Lonlabel, Canning, London." East 1300.

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

**Wire Gauze—**

N. Greening & Sons, Ltd., 16, Finsbury St., London, E.C.2. "Setscrew, Finsquare, London." London Wall 1082.  
Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1472.

**Wires and Cables (Aeroplanes)—**

Bruntons, Musselburgh, Scotland. "Wiremill, Musselburgh." Musselburgh 28.  
Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466 (3 lines).

**Wirework—**

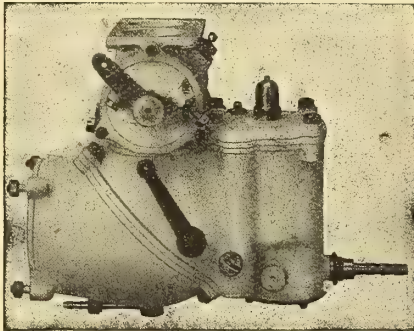
Terry Herbert & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

**Wood Refuse Suction Gas Producers—**

Ruston Proctor & Co., Ltd., Lincoln, England. "Ruston, Lincoln." Lincoln 580.

**Woodworking Machinery—**

Robinson, Thomas, & Son, Ltd., Railway Works, Rochdale. "Robinson, Rochdale." Rochdale 467.  
Sagar, J., & Co., Ltd., Halifax. "Sawtooth, Halifax." Halifax 136.  
Wadkin & Co., Leicester. "Woodworker, Leicester." Leicester 3614.



# Claud-Hobson

**CARBURETTORS**

Supplied to the Air Board  
— for Aeroplane Engines —

**H. M. HOBSON, LIMITED**

29 Vauxhall Bdg. Rd., London, S.W.1

## HANDLEY PAGE LTD.

CONTRACTORS TO  
THE ADMIRALTY  
AND WAR OFFICE

CRICKLEWOOD,  
LONDON, N.W.2.

HAMPSTEAD 7500 (9 lines).

"HYDROPHID, CRICKLE," LONDON



WE ARE PRODUCING DAY AND NIGHT

# A.G.S. PARTS,

and can accept immediate orders for:—

**HEX. NUTS.**

A.G.S. Nos.

115 B 2 BA. 238 B 2 BA.  
 115 C 4 BA. 238 C 4 BA.  
 115 D 6 BA. 238 D 6 BA.  
 116 A  $\frac{1}{4}$  BSF.

**PINS.**

(100 ton).

A.G.S. No. 383.  
 In all sizes from  
 part No. 1 to 208.

**UNIVERSAL  
FORK JOINTS.**

A.G.S. Nos. 333,  
 334, 335, 336.

**TRUNNIONS and  
LOCK NUTS.**

A.G.S. Nos. 333, 334,  
 335, 336, 337, 338, 339,  
 340 and 341.

**HEX. BOLTS.**—A.G.S. Nos.—101 68 BA, 102 4 BA, 103 2 BA, 105  $\frac{1}{4}$  BSF, 106 9/32 BSF,  
 107 5/16 BSF. various sizes.

## MEERLOO ENGINEERING COMPANY, LTD.

CONTRACTORS TO THE AIR BOARD.

EASTERN WORKS, Forest Lane, STRATFORD, LONDON, E.15.

THE MOST MODERN PLANT IN LONDON.

JOHN MEERLOO, *Jnr.*  
 Managing Director.

Telephone:  
 Stratford 973.

Telegrams:  
 "Aeromecol, Phone, London.

# SAMUEL MERCER & CO.,

Telegrams RECONCILED CANNON, LONDON

Proprietor—S. J. MERCER.

Telephone: CITY 6342.

## Metals

MILD STEEL SHEETS  
 SPECN. S3 & 9A.

Passed &amp; Stamped A.I.D.

BEST CHARCOAL  
 TINNED & LEAD  
 COATED.

BLACK C/R and C/A  
 SHEETS.

GALVD. SHEETS.

## Immediate

*Highest Prices given for*

198, UPPER THAMES ST., LONDON, E.C.4.



## for Aircraft.

BRASS AND COPPER  
 SHEETS.

SOLDER. INGOTTIN.

WELDING WIRE.

COPPER BITS, ETC.

LARGE STOCKS IN OUR  
 OWN WAREHOUSE.

## Deliveries.

*Brass and Copper Scrap.*

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



**The Hollow Structure and Aircraft Co., Ltd., Patent.**

## **WOOD PROBLEM SOLVED.**

# **HOLLOW SPARS**

And Struts for all types of machines.

**Any length, shape or section without joints.**

*FULL PARTICULARS FROM THE SOLE LICENSEES,*

**ROBERT YOUNG'S CONSTRUCTION CO., LTD.,**

AIRCRAFT CONTRACTORS,

**CANONBURY WORKS, ESSEX ROAD, LONDON, N.**

TELEPHONE—  
DALSTON 2985.

TELEGRAMS—  
BYLDINCONT NORDO LONDON."

## **INCREASED OUTPUT DEMANDS GREATER ACCOMMODATION**

To meet calls for accelerated production The  
WILFLEY COMPANY offers its services for  
the provision of Factory Buildings of all types in  
**STEEL, FERRO-CONCRETE, BREEZE  
SLABS, ASBESTOS SHEETS, BRICK**  
and other Construction.

*DESIGNS FOR COMPLETE FACTORIES IMMEDIATELY AVAILABLE.*

**TEMPORARY STRUCTURES A SPECIALITY.**

**The Wilfley Company, Limited**  
**SALISBURY HOUSE, LONDON WALL, E.C. 2.**

Telegrams : "Wrathless, Phone, London."

Telephones : City 2681 & 2682.





## SAGE AIRCRAFT

The POWER to win is gained by achieving more than others are capable of. It is this power that has made Sage Aircraft so successful

DESIGNERS AND MANUFACTURERS OF  
AEROPLANES, AIRSHIPS  
AND  
ALL FORMS OF AIRCRAFT

Manager, Aviation Department,  
E. C. GORDON ENGLAND, A.F.Ae.S.

**Fredk. SAGE & Co. Ltd.**  
**PETERBOROUGH**

Head Offices—58-62, Gray's Inn Road, London, W.C.  
Branches—Paris; Buenos Aires; Valparaiso; Johannesburg.

*Contractors to the Admiralty*

# NIEUPORT

AND

**GENERAL AIRCRAFT COMPANY, L<sup>TD</sup>.**

CONTRACTORS TO H.M. GOVERNMENT.

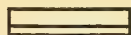
OFFICE AND WORKS—  
**LANGTON ROAD,  
CRICKLEWOOD, LONDON, N.W.2**

TELEPHONE (3 LINES)—  
WILLESDEN 2455

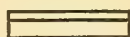
TELEGRAMS—  
NIEUSCOUT, CRICKLE, LONDON



# WYCOMBE AIRCRAFT CONSTRUCTORS, LIMITED.



HIGH WYCOMBE,  
BUCKS.



Telephones : High Wycombe 84 (Stores : High Wycombe 120).  
Telegrams : "Aircraft, High Wycombe."

Telephones : DALSTON 872.

LONDON WALL 9766.

HAMPSTEAD 4768.

## Thames Aviation Works

(BURTON'S, LTD.)

**TWO COMPLETE MILL PLANTS AND TWO YEARS' EXPERIENCE.**

Addresses of our fine Saw Mills, Works, etc.,  
— have been camouflaged by the Censor. —

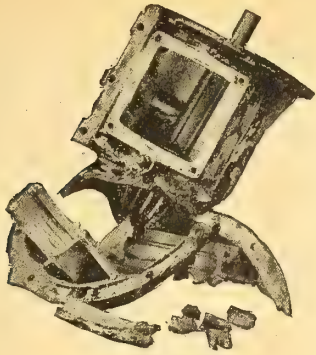
Offices only: 141, CURTAIN ROAD, E.C.

**CONSTRUCTORS OF COMPLETE AIRCRAFT**

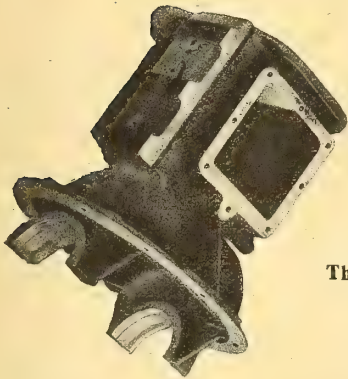
And all kinds of **WOOD PARTS, WINGS, AILERONS,**  
— **STRUTS, LEVERS, RUDDERS, NACELLES, &c.** —

**Specialities—BIG STUFF and BEST WORK.**





The Smash.



The Repair.

## Why ordinary welding is so unsatisfactory

A series of notes, which will be continued, explaining the reasons. They are taken from our letter files, and describe the actual experiences of some of our customers before coming to us.

### Note 1.

A job outwardly appeared perfect. After only slight use, was found to be fractured as badly as ever in the same place. On examination it was found that the greater part of the original crack had never been touched; only a little metal stuck on the outside to cover it up.

### Remarks.

The man who did the job no doubt thought and described himself as an expert—it looked so nice. A few hours at a night school, two or three odd moments spent at welding a few pieces of sheet metal together, and there you probably have the total experience of the so-called expert. Every welder in the NEW WELDING CO.'s shops has gone through a long and special training, and has had years of experience at his particular trade. Each one has been chosen because of his special aptitude for one particular kind of welding work—he does that work and nothing else all day and every day; he is a master of his trade, and his equal cannot be found elsewhere. He justly demands and gets the highest wages ever paid. The job described above, to such men, is nothing more than the clumsy bungling of a novice.

**THE NEW WELDING CO.,**  
**26, Rosebery Avenue, London, E.C.1.**

Telephone—5252 Holborn. Telegrams—"Windoneeda, Holb. London."

**WE CAN DELIVER**

# A.G.S. Shackles 158

**Sizes A and B ————— In any**

## QUANTITIES AT ONCE

:: ::

**The ACTUAL Manufacturers**

:: ::

# The British Gold Shell Ring Co. Ltd.

**HOUNSLOW, MIDDLESEX.**

— Telegraphic Address —  
**"GOLSHEL, HOUNSLOW."**

— Telephone —  
**HOUNSLOW 254**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

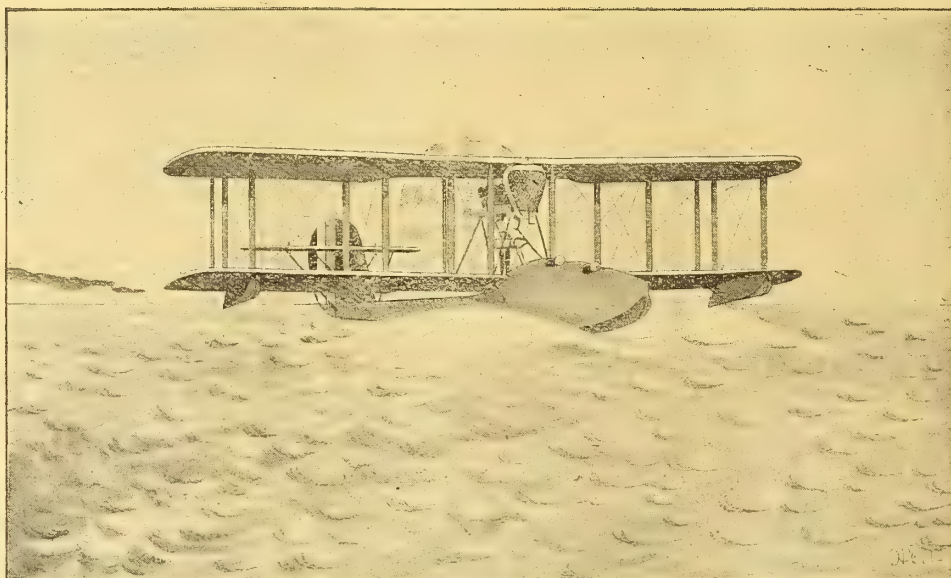


*A PRE-WAR FIRM.*

# **THE NORMAN-THOMPSON FLIGHT CO., LTD.**

**DESIGNERS & CONSTRUCTORS OF FLYING BOATS.**

**ESTABLISHED 1909.**



"Getting under way."



**"THE FIRM WHO GAVE THE FLYING BOAT TO THE NAVY."**

Works:

**MIDDLETON  
BOGNOR.**

**Bognor 48.**

London Office:

**DEWAR HOUSE,  
HAYMARKET, S.W.1.**

**Gerrard 7385.**



## THE PATENTS INDEX.

The subjoined list of recent inventions has been specially compiled by THE AEROPLANE from the current Official Patents Records.

## PATENT APPLICATIONS.

- Avey, S. Aeroplanes. No. 1371. Jan. 24th.  
 Bateman, S. S. Aviators' safety overcoat. No. 1507. Jan. 26th.  
 Beardmore, W. B. Controlling mechanism of aeroplanes. No. 1461. Jan. 25th.  
 Beardmore, W. B. Gun mountings for aircraft, etc. No. 1452. Jan. 25th.  
 Bibire, V. Device to measure simultaneously longitudinal and lateral inclination of aircraft, etc. No. 1284. Jan. 23rd.  
 Blackburn Aeroplane and Motor Co. Aircraft. No. 1373. Jan. 24th.  
 Boca, J. Strainers, etc., for use on aircraft. No. 1223. Jan. 22nd.  
 Bradley, P. R. Method of fireproofing aircraft. No. 1164. Jan. 21st.  
 Bradley, P. R. Doping aircraft. No. 1458. Jan. 25th.  
 British Emailite Co. Means for reducing visibility of aeroplanes. No. 1556. Jan. 26th.  
 Brown, H. C. Lamps or lanterns for aircraft. No. 1321. Jan. 23rd.  
 Brunner, G. E. de. Device for indicating level or displacement of aeroplanes, etc. No. 1409. Jan. 24th.  
 Clayton, E. J. Instrument for use on aeroplanes for indicating deviations from the horizontal or correct position of flying. No. 1146. Jan. 21st.  
 Doran, W. T. St. V. Clinometers for aircraft, etc. No. 1227. Jan. 25th.  
 Elvy, R. W. Petrol or spirit tanks for aircraft. No. 1497. Jan. 25th.  
 Galbraith, W. T. Bombing-machine. No. 1568. Jan. 26th.  
 Greenwood, E. F. de B. Navigating instruments for aircraft. No. 1503. Jan. 26th.  
 Greenwood, T. Aeroplane bodies or fuselages. No. 1168. Jan. 21st.  
 Hall, F. H. Aeroplane wing. No. 1289. Jan. 23rd.  
 Hall, J. I. Instruments for indicating movements of aircraft. No. 1444. Jan. 25th.  
 Harding, W. H. Lateral-level instruments for aeroplanes. No. 1358. Jan. 24th.  
 Hodgkinson, W. Level indicator for aircraft. No. 1309. Jan. 23rd.  
 Ide, H. Instrument for indicating deviation of aircraft from set course or position in relation to the earth. No. 1250. Jan. 22nd.  
 John, W. E. Screws for propulsion. No. 1206. Jan. 22nd.  
 John, W. E. Parachutes. No. 1209. Jan. 22nd.  
 Judge, A. W. Bomb, etc., quick release gears. No. 1216. Jan. 22nd.  
 Kain, J. Instrument for indicating level or angle of flight of aeroplane, etc. No. 1460. Jan. 25th.  
 Mascord, G. W. Aeroplanes. No. 1344. Jan. 23rd.  
 Roberts, C. R. Aero-engine with air density compensating cylinder and valve-gear. No. 1514. Jan. 26th.  
 Scrutton, E. W. Inclination indicator for air and watercraft. No. 1443. Jan. 25th.  
 Short, H. O. Instrument for indicating rate of ascent or descent of aircraft. No. 1511. Jan. 26th.  
 Short, H. O. Instruments for indicating rate of ascent or descent of aircraft, indicating revolutions of or controlling engines, or indicating speed of vehicles. No. 1512. Jan. 26th.  
 Tress, S. C. Caps and helmets for aviation, etc., to minimise shock of fall, etc. No. 1268. Jan. 22nd.  
 Weidner, M. Aeroplanes. No. 1365. Jan. 24th.  
 Wilson, T. E. C. Flying-machines. No. 1294. Jan. 23rd.

COMPLETE SPECIFICATIONS ACCEPTED, PRINTS OF WHICH CAN BE OBTAINED ON AND AFTER FEBRUARY 14TH, 1918.

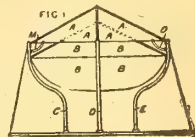
- 112,634. Oct. 5th, 1916. Austin, F. E., and Bodde, T. Course-recording apparatus.  
 112,642. Nov. 1st, 1916. Sopwith Aviation Co., and Sopwith, T. Adjustable seat for gunners on an aeroplane.  
 112,685. Feb. 10th, 1917. Blayney, R. O. Flying-machines.  
 112,688. Feb. 12th, 1917. Liversedge, A. J. Construction of struts or other members for aircraft.  
 106,485. May 1st, 1916. Vedrines, J., and Astoux, L. L. Construction of aeroplanes' fuselages.

## ABRIDGMENTS OF RECENTLY PUBLISHED SPECIFICATIONS.

- 111,407. Aeronautics. CHRISTIANSON, C. A., 33, Timber Bush, Leith, Midlothian. Addition to 7686/15.

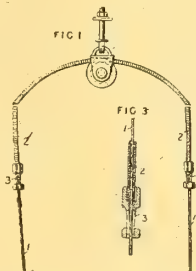
AERIAL MACHINES WITH AEROSTATS; AEROSTATS; PARACHUTES.—Aeroplanes fitted with a balloon such as is described in the

parent Specification are provided with a protective cover or canopy spaced from the upper surface of the balloon, and the exhaust gases from the engine are discharged into the space thus formed. Fig. 1 shows a canopy A supported above a balloon B by tubular standards C, D, E bent to conform to the shape of the balloon. The exhaust gases pass through the standards and discharge through pipes M.O. The balloon described in the parent Specification acts as a parachute when deflated.



## 111,446. Flexible connexions for transmission of motion.

WRIGHT, W. M., 29, Gratten Hill, Cork, Ireland, and PASHLEY, C. L., 27, Badminton Road, Balham, London.

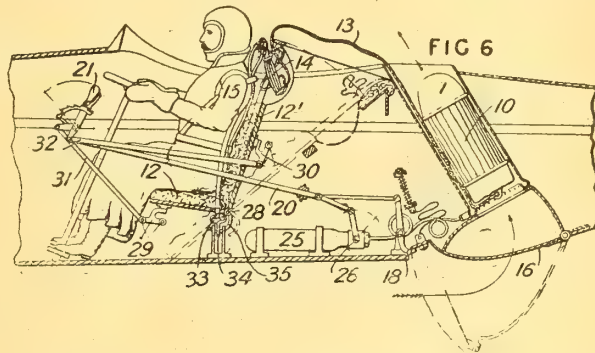


Relates to flexible connexions such as braided wire, or wire cable employed in aircraft or other vehicles or machines, for imparting motion to movable parts and consists in providing the connexion 1 at parts where it is brought into frictional contact with guides or pulleys with a protective flexible metal sheath 2 which may be a length of spirally wound metal.

The sheath is held in position by grips 3 which may be released to allow of the sheath being slid along the connexion for inspection purposes.

## 111,498. Aeronautics. CALTHROP, E. R., Eldon Street House, Eldon Street, London.

Parachutes.—To effect or assist the launching of a parachute from aircraft without the employment of an injector device, the relative wind is utilised to effect or assist the ejection of the parachute and its associated parts from a container in which they are normally nested, and also to assist the withdrawal of the aviator to whom the parachute is attached. Fig. 6 shows a parachute 10 housed in a forwardly inclined container 1 and connected by a cord 13 and shock-absorber 14 to the aviator's harness 15. The seat 12 and seat back 12<sup>1</sup> are hinged at 28



and are held in their normal positions by catches 29, 30 which are connected by rods 31, 32 to a control lever 21. A rod 20 attached to the control-lever 21 is connected through the linkages shown to the valve 26 of a compressed-air reservoir 25, and to a catch 18 which normally holds in position a hinged section 16 in the floor of the fuselage. The aviator is normally secured to the seat by straps 33 having eyes 34 engaged by hooks 35 on the seat 12. When the lever 21 is moved, the eyes 34 are released, the seat 12 and seat back 12<sup>1</sup> fall into the positions shown in dotted lines, compressed air is admitted to the container 1 from the reservoir 25, and the hinged section 16 falls so as to scoop up air into the container 1 and assist in the ejection of the parachute. The blast of air from the container 1 assists in the opening of the parachute when ejected and also in keeping the aviator clear of the fuselage as he is drawn out. Modifications are described in which hinged tubular extensions of the container 1 are used instead of the hinged section 16, and in one case the container 1 also slides in a pivoted ring so that its mouth is normally withdrawn into the fuselage. Specifications 21312/14 and 1077/15 are referred to.

## CONCERNING WIRE ROPES.

Mr. Joseph Wilson, part author of the article on Wire Ropes, which appeared in THE AEROPLANE for Jan. 9th, points out two unfortunate printer's errors in the said article:—In the section of the article sub-headed "Tricks of the Trade," the figures half to quarter gauge sizes should read one to one and quarter gauge sizes. Under sub-heading "Stopping the Game," 125 tons should read 135 tons.



[illegible][illegible][illegible][illegible]

**AIRCRAFT SUPPLIES**

**COMPANY'S STOCK LIST—Year 1924 (continued).**

**H. T. STEEL**

**WIRE**

(A.G.S. No. 155)

16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

**WIRE FERRULES (A.G.S. No. 156)**

16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

**(ERS) (Duralumin)**

**G.S. No. 157—**

16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100


**Clamped)**

16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

**112**

# AIRCRAFT SUPPLIES



## AIRCRAFT SUPPLIES COMPANY LTD

WOLFE  
100,000  
100,000  
100,000

TELEGRAMS  
"AIRCRAFT"  
100,000

ROOMS & STORES  
5 ACRE, LONDON  
WAR OFFICE AND AIR CORPS

**KINDLY** write me  
immediately if you  
are interested in any  
of the possibilities  
discussed below.

For "Stop Shop"  
Hurry—write today!


**DELIVERIES**  
made in London  
anywhere in the  
country.

4000—2nd, 1918

### W.C. 2

## W LIST THURSDAY, JAN. 3rd, 1918

	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	22
--	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	----



## A Journal for Aircraft Manufacturers

**Aircraft Supplies**, our Fortnightly House Journal, published on alternate Thursday evenings contains a complete list of Stock of Aircraft Parts up to the time of going to press, Current Prices, Details of New Items, Enquiry Bureau, Charts and Tables of Various Parts, and Short Articles of interest to Aircraft Manufacturers. Copies of "Aircraft Supplies" will be sent FREE to the Air Services and to the Aircraft Industry (those in charge of Stores and other Works and Service Departments only). Applications should be made on business or official paper and should state nature of contracts.

Back numbers of "Aircraft Supplies" containing the following articles, can be had free upon application.

**VOL. 1.**—No. 2.—March 28th, 1917.—"Overhead Charges," by G. H. Mansfield.

**VOL. 2.**—No. 3.—July 5th, 1917.—"Workmen's Unemployment Insurance," by T. Kemp Walton, A.C.I.S.; No. 4.—July 19th, 1917.—"On Annealing Mild Steel Bar," by J. T. Morton; No. 5.—Aug. 16th, 1917.—"Further Notes on Steel Testing," by E. A. Allcut; No. 7.—Sept. 13th, 1917.—"Notes on the Manufacture of Iron and Steel," by J. Herring Smith; No. 8.—Sept. 27th, 1917.—"Notes on the Manufacture of Iron and Steel." (Second portion). By J. Herring Smith; No. 12.—"Impact Testing of Aircraft Steel," by E. A. Allcut; No. 13.—Dec. 6th, 1917.—"On the Rigging of Aircraft." (Part 1.) By J. T. Morton; No. 14.—Dec. 20th, 1917.—"On the Rigging of Aircraft." (Part 2.) By J. T. Morton.

**VOL. 3.**—No. 1.—Jan. 3rd, 1918.—"On the Use of Charts and Tables in the Aircraft Industry," by G. H. Mansfield.

All other issues are now out of print. We shall shortly be publishing, in book form, the whole of the articles which have previously appeared in issues of "Aircraft Supplies."

### THE AIRCRAFT SUPPLIES COMPANY LTD

**ASCOL HOUSE, 125, LONG ACRE, LONDON, W.C.2**  
 Managing Director—Telephone—Telegrams—  
 G. H. Mansfield. Gerrard 276. "Upcast, Ran," London.

**Contractors to the Air Board.**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# THE AIRCRAFT TRADER

## MARKET TOPICS.

(Prices are for quantities on usual terms.)

January 31st, 1918.

**COPPER.**—Official confirmation of the price of 23½ cents for Copper in U.S.A. has now been received and this price will remain unchanged until June 1st, 1918. Apart from the transport problem the Copper situation in U.S.A. is very satisfactory. The output for December is somewhere in the region of 40,000 tons.

The position here is unchanged, the authorities still maintaining strict control of supplies.

### Comparative Prices.

To-day .....	£110 0 0 per ton.
Lowest Price, 1917 .....	110 0 0 per ton.
Price in 1916 .....	91 0 0 per ton.

**TIN.**—At the beginning of last week buyers were buying spot Tin and the market was very firm, near Tin bringing £301. There is, however, little interest being shown at present and prices are declining.

There does not appear to be any anxiety to book ahead, and, although the price is high, there does not appear to be any indication that there is likely to be any appreciable decline. It is generally thought that there is likely to be a great scarcity of Tin in the near future.

### Comparative Prices.

January 25th .....	298 10 0 per ton.
January 21st .....	298 0 0 per ton.
January 18th .....	295 0 0 per ton.
Highest Price, 1917 .....	309 0 0 per ton.
Lowest Price, 1917 .....	180 10 0 per ton.

**LEAD.**—The only item of interest this week is the formation of a manufacturers' association with the object of protecting their interests against the effects of official control, restrictions, and official interference with post-war trade.

There still appear to be fairly good supplies available for national requirements.

**STEEL.**—The supplies of Special Aircraft Steels to Air Board Specifications can now be considered satisfactory, and there does not appear to be any possibility of any shortage. Cast Steel and H.S. Steel supplies are not, unfortunately, as satisfactory, although there is a marked improvement in deliveries, and earlier deliveries are being promised by the mills.

The official prices for High Speed and Specification Steels remain unchanged; but the price for Cast Steel continues to steadily advance.

**TIMBER.**—The question of supplies is the all-absorbing consideration. There is a slight improvement, but far from being appreciable. A fair quantity of Silver Spruce substitute has recently arrived. The procedure to be adopted with this material appears to be as follows:—

Assuming the contractor has received 150 standards of P—. Test pieces which are supposed to be representative of the whole parcel are taken and sent to Headquarters by the A.I.D. inspectors—time, 4 days. If fortunate, a reply will be received in probably 14 days, say 7 days—total 11 days. If the wood is passed, the next point is: Where can it be used?

It is not advisable to cut the wood up until the result is known, as it is reported that the Air Council has now advised inspectors that substitutes which are graded B can only be used on school machines. There is no reason on earth why this could not have been put on the specification.

Some intelligent mind has nearly managed to interpret the specification and the result appears to be that Spruce which conforms to the tests is graded A 1, and other woods which conform to the test are graded A 2. It is now necessary to use a little imagination to realise that seeing the substitutes conform to the specification they can be used wherever Silver Spruce has heretofore been used, and, if this is correct, why grade them A 2?

If, on the other hand, grade A 2 implies that the wood can only be used on all parts other than spars, the natural query is Why? seeing the wood passes the same tests as grade A 1 timber. Surely it is time someone cleared the matter up. It has been stated on good authority that even the A.I.D. inspectors are not quite sure where grade A 2 wood can be used.

Therefore, to resume our inspection time table, another 7 to 10 days must be allowed for the inspector to find out what grade A 2 means, making the total 21 days. This, of course, will not assist rapid production.

Now, if it does not pass, the contractor will object to the rejection of £42,000 worth of Timber on one test, and there will be a word-war by correspondence—another test will be allowed, i.e., another 11 days. If it fails again—infinite minds must try and prophesy the result.

Seeing that Silver Spruce is accepted for fighters without question, why not divert every stick of substitute wood to firms building school machines and insist upon them using it, and let the firms building fighters have every stick of Spruce which comes into the country? This "may" keep them going while the official tests are carried out on substitutes.

Perhaps someone will kindly answer the following conundrum:—

"If 75 per cent. of the substitute timber is graded 'B,' where will the constructors obtain timber for building fighters?"

Supplies of 3-Ply are very difficult to obtain, and it is certainly time definite steps were taken to ensure supplies being available during the next six months. The outlook is far from satisfactory. It is really painful to see hundreds, if not thousands, of boards being "turned down" by the A.I.D. which, if not suitable for important parts of the machines, such as fuselage sides, cowls, bottoms, etc., are perfectly satisfactory for portions of the machines where practically any kind of 3-Ply could be put.

Only fair shipments of Mahogany have recently been received, but, compared with other woods, supplies are easier to procure.

Prices of all Timber continue very firm. Mahogany and Silver Spruce are advancing.

**FABRIC.**—The fabric position appears to be a little easier. The Irish mills are working steadily and the output is more satisfactory. The question of flax supplies will be the problem which will be difficult to solve.

The official price has not yet been altered.

## FLAX SUPPLIES.

A meeting of representatives from every branch of the linen industry in Ulster was held recently in Belfast to take steps to avert the crisis brought about by the almost certain stoppage of all supplies of Russian flax. A resolution was adopted approving of a scheme to undertake the renting of land and the cultivation of flax over and above the expected increased acreage of farmers, and commending a proposal to raise a guarantee fund of £500,000 by the trade, subject to obtaining a guarantee from the Government of £1,500,000. It was announced that guarantees had been received from the trade and institutions interested in the industry amounting to £170,000, including £30,000 from the three banks whose headquarters are in Belfast.

## THE GERMAN INDUSTRY.

It is reported that owing to German industrial troubles the Allgemeine Elektrizitäts Gesellschaft, of Berlin, has had to close its doors. After Krupp's, the "A.E.G." holds the premier position in German industry. The head of the firm, Dr. Walther Rathenau, has played a prominent part in organising German industry for war, and quite early in the day took over the direction of the raw materials department.

Dr. Rathenau is a very remarkable man. He is not yet fifty years of age, and his travels in many lands have given him a cosmopolitan nature and a fluent tongue in as many languages. Apart from the "A.E.G.," he is actively connected with the control of over fifty other concerns, bringing to bear upon his work the experience gained as a modest engineer in the "A.E.G.," which was founded by his father.

The pre-war work of the "A.E.G." firm in connection with aircraft is well known to students of aeronautics, and during the past three years it has been engaged chiefly on the production of single and twin engined multi-seater aeroplanes, chiefly of the armed reconnaissance type.

[One assumes that these German strike stories are being purposely exaggerated in order to spread the microbe of anarchy among Germany's enemies. Men of the intelligence of the Herr Doktor Rathenau are quite capable of thus turning their temporary troubles to their permanent advantage.—Ed.]





# CELLON

(NON-POISONOUS)

# DOPE

**CELLON LTD.,**

**BROAD STREET HOUSE, E.C.2.**

TELEGRAMS—"AJAWB," LONDON

TELEPHONES—LONDON WALL, 5359, 3622,

**Contractors to H.M. Government.**



# AIRCRAFT FINANCE

## CURRENT TOPICS.

An action at law was heard recently in the Chancery Division of the High Court of Justice before Mr. Justice Neville, which is of more than passing interest to the Aircraft Industry, owing to the conflicting rumours afloat concerning the principals, and the details of their business connections and transactions; but as I understand further legal proceedings are pending, the whole matter must be considered and dealt with *sub judice* for the present. The further proceedings and the future operations will be watched with a jealous eye, and duly commented upon in these columns at the proper season. The action was entered as "Cowper-Coles Aircraft Company, Limited, v. Cowper-Coles," and was brought, according to the report published in the "Times," to restrain the defendant, Mr. Sherard Osborn Cowper-Coles, from purporting to act as a director of the plaintiff company or from interfering with the management of the company's business, and from entering upon the company's premises, and from giving orders to, or interfering with, workmen or servants of the company.

The company was incorporated in June, 1917, as a private company under the Companies Acts, 1908 and 1913, with a capital of £6,000, afterwards increased to £16,000, and the amount of capital issued as paid up was £4,252. The company was established chiefly to manufacture and sell aircraft. It was a controlled establishment under the Munitions of War Act, 1915, and was exclusively engaged in executing several contracts for the Government, and its business was conducted under the supervision of the Air Board and an inspector appointed by the Aerial Inspection Department of that body. There were five directors, of whom the defendant was the chairman. The defendant had become largely indebted to the company for moneys advanced, and on Jan. 15th last the company issued a writ against him in the King's Bench Division for £3,000. There was also a judgment debt against him from a bank for £1,300.

In these circumstances the board of the company came to the conclusion that the defendant was commercially insolvent; and accordingly on Jan. 14th last they informed him by letter through the secretary that under Article 21 (a) of the company's articles of association he had vacated his office of director, and that he must no longer interfere in the company's affairs. The defendant did not acknowledge the letter, and he continued to hold himself out as a director of the company and refused to permit any servant or workman to come to the company's works except those who were engaged by him. He gave orders that the workpeople were to take instructions from no one but himself, and picketed the works with four men, with instructions not to allow the inspectors or the general manager to go on the company's premises.

On Jan. 22nd the company issued the writ in this action for an injunction and obtained leave to serve that notice of motion for an interim injunction for to-day.

Mr. Jenkins, K.C., and Mr. Beebe appeared for the plaintiff company.

Mr. Harold Solomon Simmons, for the defendant, asked that the motion might stand over for a week to enable the defendant to answer the plaintiffs' affidavits. He was instructed that the defendant had a complete answer, but he would give no undertaking in the meantime.

Mr. Jenkins: Then I decline to agree to an adjournment of the motion as the matter is urgent, and I move *ex parte* for an interim injunction.

Mr. Justice Neville: You are entitled to that on the plaintiffs' affidavits, and if the defendant does not obey the injunction I shall not hesitate to commit him to prison.

Mr. Simmons: May I, as *amicus curiæ*, ask that the defendant may have an opportunity of answering the plaintiffs' affidavits?

Mr. Justice Neville: You may take leave to move to discharge the order on giving a two days' notice of motion. But the defendant must clearly understand that in the meantime the injunction must be obeyed, whether it is right or whether it is wrong.

## INVESTMENT REFLECTIONS.

There is so much variation taking place week by week in the Stock Exchange quotations of many Aircraft companies' shares, some showing marked appreciation in value, whilst others

steadily or suddenly depreciate, all so puzzling to the uninitiated shareholders, that some explanatory comment from me on the subject in these columns is sure to be welcomed.

Many factors at the moment are influencing genuine sales and purchases—the principal of which are—variable dividend declarations, the operations of the excess profits duty—absence of the usual balance-sheets—the uncertainty of trade conditions after the war, etc., etc.

The list of adverse factors could be much extended, but this will suffice to show some of the causes which bring about genuine transfers. All this is perfectly legitimate and proper business; but what I want to put the investor upon his guard against is what is known in the City as "rigging."

It may generally be accepted that the Stock Exchange quotation of a share acts as a safe guide to indicate the financial position of the company, reflecting its prosperity, or, on the contrary, its decline. To the casual observer this would seem obvious, but it is because there is grave danger in blindly following published market quotations as a guide that I feel called upon to explain clearly to readers of this column that market quotations are not always to be relied upon, and may well be a bait to trap the unwary.

Certain shares at the present moment stand at quotations that are unduly inflated, and out of all proportion both to their dividend-earning capacity and to the financial position of the company, and the quotations of these particular shares continue to steadily rise.

Shareholders anxious to realise at the quoted figures are informed that the transactions can only be carried out by special negotiation; in other words, they are unable to realise at the prices quoted, but many are misled by the rising prices, and no difficulty is placed in their way should they desire to purchase small or large numbers of these shares. This is a position which is only possible owing to the particular war conditions of the present moment, and to the restrictions imposed upon the Stock Exchange by the Treasury, compelling all transactions to be on a cash basis.

The present position could not have existed in pre-war days under the old conditions, as the undue inflation would have caused "bear" selling; in other words, speculators would have sold "short" without having the stock, with the knowledge that the quotation would be bound sooner or later to drop, and the seller in place of delivering the stock would have arranged to "carry-over" until such time as the inevitable drop took place, and thereby be in a position to make a big profit.

This "bear" selling in the old pre-war days would have had the effect of preventing undue and improper inflation of quotations, therefore the Treasury restrictions in this respect are not altogether an unmixed blessing. It is a condition of affairs that obtains not only in the shares of Aircraft companies, but affects every class of investment, and shareholders will do well to take heed of this note of warning, and not place too much reliance on published market quotations.

G. A.

## AERIAL CARRIERS.

Among the latest registrations at Somerset House is that of the Alliance Aeroplane Co., Ltd. The capital of this private company is £451,000 in £1 shares (450,000 Ordinary and 1,000 Deferred), and its objects are to manufacture and deal in aircraft of every description, to construct aerodromes, to act as aerial and general carriers of goods and passengers, to develop aerial navigation, and teach aviation and aeronautics. The subscribers (each with one share) are: J. Ritson, 83, Lonsdale Road, Barnes, chartered secretary; and G. Barclay, 3, Chandos Avenue, Oakley Park, chartered accountant. I hope to be able to give further details concerning this important registration shortly.

## NEW COMPANIES REGISTERED.

The files of the following new companies registered with the nominal capitals of £5,000 and upwards are now available for inspection at Somerset House:—

ALLIANCE AEROPLANE CO., LTD.—Jan. 26th. £451,000 in £1 shares (450,000 Ord. and 1,000 Deferred).

AERO TANKS, LTD. Registered Jan. 23rd. Capital, £2,500 in 10s. shares. Registered Office: Capel House, 54, New Broad Street, E.C.



**PORTHOLME AIRCRAFT CO., LTD.** Registered Jan. 24th. Capital, £60,000 in £1 shares. To acquire the business of the Portholme Aerodrome, Ltd., and to carry on the business of aeronautical, electrical, motor and general engineers. Solicitor: W. B. Styer, 11-12, Fenchurch Street, E.C.

#### MORTGAGES AND CHARGES.

**COWPER-COLES AIRCRAFT CO., LTD.**—Registered Jan. 10th, 1918. Memorandum of deposit securing all moneys due or to become due to London and South Western Bank, Ltd., charged on all moneys due or to become due under certain contracts.

**MIDLAND MOTOR CYLINDER CO., LTD.**—Registered Jan. 14th, 1918. Mortgages, £2,500. Charged on freehold premises known as Etna Woods, Smethwick.

**MOSS GEAR CO., LTD., BIRMINGHAM.**—Registered Jan. 9th, 1918. Debentures, £25,000. General charge.

#### DIVIDEND ANNOUNCEMENT

**GREENWOOD & BATLEY.**— $\frac{7}{8}$  per cent. (15s. per share), free of tax, on Ordinary shares (interim).

#### ANSWERS TO CORRESPONDENTS

*Enquiries on any subject relating to Investments, Stocks, Shares and Securities of aircraft or kindred companies will be answered in these columns, free of charge.*

*Letters should be accompanied with the names and address of the writer (solely as evidence of good faith) and the correspondent should adopt a "nom de plume" under which the reply will appear.*

**"PERPLEXED."**—A director is assessable under Schedule E for all fees, salaries, perquisites and other profits. Payment of tax in no way affects the Crown's right to assess under Schedule E. In fact, when the company pays the tax, the assessment is not made on the company, but application is made to the secretary instead of to the director. The tax paid by the company is therefore part of the emolument of the office and is assessable, so as to make the director liable to the same extent as an employee, whose salary after he has paid tax equals the salary of the director.

**"LIQUIDATION."**—When shares only partly paid are transferred after a call has been made, and before it has been paid, the liability is not transferred so far as the company is concerned. The general practice is for the company to refuse to accept the transfer. In the case of a company in course of being wound up the liquidator has the right to sue and recover from the past transferor in certain defined circumstances. The liquidator must include in his list of contributories past members of all partly paid shares where the transfer has been effected within the period of one year prior to the date of the company going into liquidation, and such member may be rendered liable for the full amount unpaid on the said shares.

**"HANDY-MAN."**—Your view of the misrepresentation of the facts would appear to be quite correct, but you must bear in mind that a contract voidable for fraud cannot be set aside when the other party cannot be restored to his status quo. Legal precedent has decided that a contract cannot be rescinded in part and stand good for the residue. Your only course would appear to be an action for damages.

**F. J. R. (Luton).**—So much depends upon special circumstances that it is difficult to advise. If you can afford to lock up this capital for a period you will undoubtedly benefit; but, if your circumstances do not permit risks being taken, your best course is to put the money into War Bonds.

**"FUNDS."**—Directors alone have power and in their sole discretion as to how and when a call upon shares shall be made, and the Courts will not interfere in any action unless it can be clearly shown that the directors have acted in their own private interest and not for the benefit of the company.

#### A VADE MECUM FOR MOTORISTS.

In their own way the car and automobile are as complicated and liable to mechanical trouble of all kinds as is the aeroplane, and the many thousands of persons concerned with the production and use of aircraft, who are also compelled to use road locomotives of all kinds, cannot fail to welcome any volume which comprehensively treats of the running, up-keep and repair of motor-cars.

A copy has come to hand of an American compendium entitled "Dyke's Automobile and Gasoline Engine Encyclopædia," which is said to be the standard work concerning automobile engineering in the United States. The statement that 250,000 copies of this book have already been sold cannot fail to impress one as to the importance with which this book is regarded.

Although this encyclopædia deals in particular with American cars, there is much which it contains that is applicable to any make of car, and it is manifest that the compiler, Mr. A. L. Dyke, is qualified to write on this subject. The first portion of the volume is devoted to an exhaustive description of practically every known type of car engine, the most minute details being dealt with and illustrated by the clearest possible diagrams. Side by side with the descriptions of these various engines are clear directions for achieving adjustments and repairs, and most useful information is given regarding engine tuning. There are many full page and double page diagrams, which could hardly fail to educate even the village idiot.

The various problems of ignition, lubrication, and carburation are set forth both as regards theory and practice, and much space is devoted to the description of ignition and lighting sets on most of the well-known American cars, and drawings are shown of the different arrangements of self-starters, generators, accumulator and lighting and heating systems. Another section is devoted to the handling of a car on the road and to its repair both in the course of a journey and in the garage, special pages being devoted to cleaning, touring, tyre repair, and the general work of road gear, such as transmission, wheels, and clutches.

It is also not surprising that a special section is devoted to the care and upkeep of the Ford automobile. In view of the thousands of illustrations and a matter of 850 pages the price charged for the encyclopædia, namely, one guinea, is moderate.

The sole agent for Great Britain is Mr. S. G. Gillam, the Motor Technique Bureau, Dome Buildings, Richmond, Surrey, but naturally copies can be obtained to order through any bookseller, or from the Wm. Dawson Publishing Co., Ltd., 2, Breams Buildings, E.C.4.

#### SOME WORKS MOVES.

Mr. J. Nelson Parr, of the Buying Department at the Aircraft Manufacturing Co., Ltd., has joined the staff of Crossley Motors, Ltd., Manchester.

"The Highflyer," the works magazine of the Norman Thompson Flight Co., Ltd., of Bognor, announces the following departures from its staff:—

Mr. F. P. H. Beadle, who has accepted the post of Designer to the Gosport Aircraft Co., Ltd.

Miss Holmes, who has gone to Vickers, Ltd., Weybridge. Miss Holmes was a joint editor of "The Highflyer."

Mr. G. C. King, who is now branch Works Manager to the Gosport Aircraft Co., Ltd., at Southampton.

#### ADVERTISING WHICH LEAVES ONE COLD.

The following extract is taken from the "Curtiss Flyleaf," the House Organ of the Curtiss Aeroplane and Motor Corporation of New York:—

Americans invented the heavier-than-air flying machine. The British with the use of their own and the Curtiss aircraft are credited with using the most serviceable types in the war.

A pretty compliment to the British Aircraft Industry, but it was a pity that the writer of the paragraph made it unnecessary for the British Industry to pay the compliment to him, instead of paying it to himself—if it were true.

#### CURRENT SHARE QUOTATIONS.

Aircraft Mfg. Co. 7% cum. pref. £1 ...	23-	24-
7% cum. & ptg. "B" pref., (fully paid) ...	22-	23-
Armstrong (Sir W. G.) Whitworth & Co., Ltd. 4% cum. pref. £5 ...	3½	3½
5% 2nd. pref. £1 ...	17/-	18/-
£1 ordinary ...	41/-	42/-
Austin Motor Co., Ltd. 7% cum. pref. £1 ...	18-	19-
£1 ordinary ...	18-	19-
Birmingham Small Arms Co., Ltd. £1 ordinary ...	53/-	54/-
5% cum. "A" pref. 6% cum. "B" pref. ...	4½	4½
20/-	21/-	
Boulton & Paul, Ltd. 5% cum. pref. £1 ...	3	3
Brown Bros., Ltd. 6% cum. pref. £5 ...	4½	4½
Darracq (A) & Co., (1905) Ltd. £1 ordinary ...	24-	25-
7% cum. pref. £1 ...	22-	23-
Electric Construction Co., Ltd. 7% cum. pref. £1 ...	21-	22-
£1 ordinary ...	24-	25-
Fellows Magneto Co., 8% cum. partip. pref. ...	16/-	17/-

General Electric 6% cum. pref. £10 ...	11½	10½
Co., Ltd. £10 ordinary ...	19½	20
Gwynnes, Ltd., 5% cum. pref. ...	5½	5½
Ordinary ...	35/-	36/-
Greenwood & Batley, Ltd., £10 ordinary ...	9½	10
Humber, Ltd., 6% cum. pref. £1 ...	14	15-
£1 ordinary ...	21/-	22/-
Napier (D) & Son, Ltd., 7½% cum. pf. £1 ...	18-	19-
Peter Hooker, Ltd., £1 7% cum. partip. 1st pref. ...	19/-	20-
Rolls Royce, Ltd., £1 ordinary ...	67/-	68/-
Rudge Whitworth, Ltd., £1 ordinary ...	45/-	46-
Ruston, Proctor & Co., Ltd. £1 ordinary ...	28/-	29-
5% cum. pref. £1 ...	16-	17/-
Sunbeam Motor Car Co., Ltd., £1 ord. ...	77/-	78-
Straker Squire, Ltd. (1913), £1 ordinary ...	21/-	22/-
S. Smith & Son, Ltd. (Motor Accessories) £1 ordinary ...	27/-	28/-

Triplex Safety Glass, £1 ordinary ...	24-	25-
Vickers, Ltd., 5% pref. stock ...	78	826
5% pref. shares. £1 ...	17/6	18/-
£1 ordinary ...	41/-	42-
Wm. Beardmore & Co., Ltd., 6% c. pf. £1 ...	19/-	20-

#### GENERAL INFORMATION.

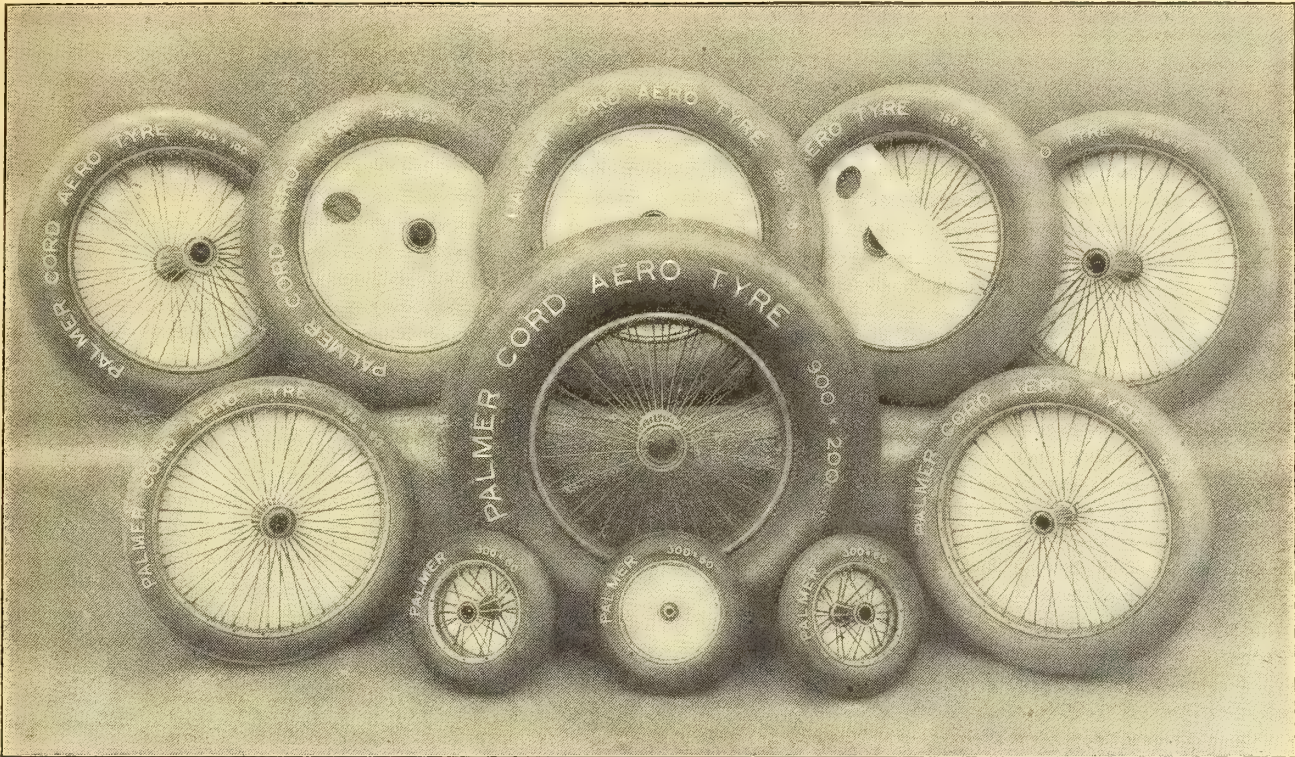
Armstrong, Whitworth (1916).	Owing to the difficulty of estimating liabilities under Finance and Munitions Acts, the accounts will not be ready until a later date.
Austin Motor (1916).	
B'ham. Small Arms (1915-16).	
Rolls Royce.	
Rudge Whitworth.	
Straker-Squire (1915).	
Sunbeam Motor.	
Thornycroft (J. I.) & Co.	
Vickers (1915 and 1916).	

x—ex dividend



# PALMER

## LANDING WHEELS & TYRES



STANDARD SIZES :

Tyre Sizes	Wheel No.	Hub		Track Line	Tyre Sizes	Wheel No.	Hub		Track Line	Tyre Sizes	Wheel No.	Hub		Track Line
		Length	Bore				Length	Bore				Length	Bore	
		m/m	m/m	m/m			m/m	m/m	m/m			m/m	m/m	m/m
300×60	16	111.12	25.4	Central	700×75	*80	178.	44.45	132/46	750×125	96	178.	55.	132/46
"	17	72.39	12.7	Central	"	*91	178.	31.75	132/46	800×150	82	185.	55.	135/50
450×60	30	89.	31.75	Central	"	*98	178.	44.45	Central	"	85	185.	55.	Central
575×60	111	150.	38.09	104/46	700×100	92	185.	55.	135/50	"	†36	185.	55.	135/50
"	21	160.	28.	Central	"	95	185.	55.	Central	"	†40	185.	60.32	135/50
"	34	150.	31.75	104/46	"	77	178.	44.45	132/46	1000×150	97	250.	65.4	Central
650×65	78	178.	44.45	132/46	"	93	150.	40.	Central	"	102	185.	55.	125/60
"	100	178.	38.09	132/46	"	33	150.	38.09	Central	"	201	185.	60.32	125/60
"	101	178.	31.75	132/46	"	99	178.	38.89	132/46	900×200	39	185.	55.	Central
600×75	111	150.	38.09	104/46	750×125	92	185.	55.	135/50	"	42	185.	60.32	125/60
"	21	160.	28.	Central	"	95	185.	55.	Central	"	47	185.	55.	125/60
"	34	150.	31.75	104/46	"	77	178.	44.45	132/46	1100×200	202	185.	60.32	Central
700×75	78	178.	44.45	132/46	"	93	150.	40.	Central	"	52	185.	55.	116/69
"	100	178.	38.09	132/46	"	33	150.	38.09	Central	"	57	185.	55.	Central
"	101	178.	31.75	132/46	"	99	178.	38.89	132/46	"	203	185.	60.32	116/69
										"	204	185.	60.32	Central

\*Wheels Nos 80, 91 and 98 are fitted with a wider and stronger rim, and the 700x75 tyres when fitted to this rim caliper 83 m/m.

†Wheels Nos. 36 and 40 are of stronger type than the other wheels for 800x150 tyres.

### THE PALMER TYRE LIMITED

Contractors to the Admiralty and to the War Office,

119, 121, 123, SHAFTESBURY AVENUE, LONDON, W.C.2.

Telegrams: "TYRICORD. WESTCENT, LONDON."

Telephone: GERRARD 1214 (Five lines).

PARIS: 24, Boulevard de Villiers, Levallois-Perret.





# AIRCRAFT MANUFACTURING COMPANY———LIMITED

Contractors to  
War Office and Admiralty

London Office

27, BUCKINGHAM GATE, S.W.1.

Offices & Works

HENDON, N.W.9.



(Continued from page 557.)

Lt. (Temp. Capt.) O. C. BRYSON, Yeo. and R.F.C.  
 Temp. Sec. Lt. P. W. S. BULMAN, Gen. List and R.F.C.  
 Lt. (Temp. Capt.) R. L. CHIDLAW-ROBERTS, Hants R. and R.F.C.  
 Lt. (Temp. Capt.) J. M. CHILD, Manch. R. and R.F.C.  
 Sec. Lt. J. H. COOPER, Arg. and Sutthd. Highrs. and R.F.C.  
 Sec. Lt. W. E. DAVIS, Glouc. R. and R.F.C.  
 Lt. F. H. DEAR, R. Suss. R., and R.F.C.  
 Lt. (Temp. Capt.) I. A. J. DUFF, Dorset R. and R.F.C.  
 Sec. Lt. R. L. M. FERRIE, R.F.C., Spec. Res.  
 Lt. R. F. S. MAUDUIT, D. Gds. and R.F.C.  
 Lt. (Temp. Capt.) V. A. H. ROBESON, R.F.C., Spec. Res.  
 Sec. Lt. (Temp. Capt.) W. W. ROGERS, R.F.C., Spec. Res.  
 Capt. H. T. F. RUSSELL, R. Welsh Fus. and R.F.C.  
 Temp. Capt. W. H. N. SHAKESPEARE, R.F.C.  
 Sec. Lt. L. E. SHAW-LAWRENCE, E. Kent R. and R.F.C.  
 Temp. Sec. Lt. (Temp. Capt.) J. A. SLATER, Gen. List and R.F.C.

## AUSTRALIAN IMPERIAL FORCE.

Lt. L. H. HOLDEN, F.C.  
 Lt. R. W. HOWARD, F.C.  
 Lt. F. G. HUXLEY, F.C.  
 Capt. R. C. PHILLIPS, F.C.  
 Lt. H. TAYLOR, F.C.  
 Lt. (Temp. Capt.) G. C. WILSON, F.C.

## FROM THE COURT CIRCULAR.

BUCKINGHAM PALACE, Jan. 30th.

The following Officer had the honour of being received by His Majesty at Buckingham Palace, when The King invested him with the Insignia of the Division of the Order into which he has been admitted:—

## THE DISTINGUISHED SERVICE ORDER AND THE MILITARY CROSS AND BAR.

Capt. JOHN ANDREWS, Royal Scots, attd. R.F.C.  
 His Majesty then conferred decorations as follows:—

## THE DISTINGUISHED SERVICE CROSS.

Flt. Lt. RONALD THORNEY, R.N.A.S.

## THE MILITARY CROSS AND BAR.

Sec. Lt. LESLIE POWELL, Gloucester Regt. and R.F.C.

## THE MILITARY CROSS.

Capt. EUAN GILCHRIST, Lancers, attd. R.F.C.  
 Lt. WALTER BASSETT, A.F.C.  
 Lt. GEORGE SCOTT MURRAY, R.F.C.

BUCKINGHAM PALACE, Feb. 4th.

The Prince Albert, attended by Staff Surgeon Louis Greig, R.N., left the Palace for the Royal Naval Air Station, Cranwell.

## NAVAL.

The following appointments have been made in the Royal Naval Air Service:—

JAN. 29th.—Temp. commissions as Lt. (R.N.V.R.) granted to H. Cox and H. S. Watson, seny. respectively Dec. 30th, 1917, and Jan. 24th.

Flt. Comdr. Brind, R.N., who was recently appointed Assistant to the Director of Naval Recruiting, has been gazetted Sqdn. Comdr.

JAN. 31st.—W.O. (II.).—B. Turner, granted temp. commn. as Lt. (R.N.V.R.), seny., Jan. 27th.

FEB. 1st.—Mr. T. P. Jenkins granted temp. commn. as Lt. (R.N.V.R.), seny. Feb. 4th.

## ADMIRALTY COMMUNIQUÉS.

JAN. 29th.—During January 28th a bombing raid was carried out by naval aircraft on the enemy aerodromes at Aertrycke and Engel. Many bombs were dropped on objectives.

During the usual fighter patrols, two enemy machines were brought down out of control.

All our machines returned safely.

The British Commander-in-Chief has reported that a reconnaissance carried out about midnight on Sunday established the fact that the "Goeben" was no longer on shore on Nagara Point.

JAN. 30th.—Soon after midday on January 29th, naval aircraft raided Coolkerke aerodrome, north of Bruges. Many bombs were dropped over the objective. The sheds and hangars were well straddled, and a fire was observed to break out among buildings at the north-west corner of the aerodrome.

In the course of the usual fighter patrols, one enemy aircraft was destroyed and one shot down out of control. Many indecisive combats took place.

All our machines returned safely.

FEB. 1st.—During Jan. 31st a bombing raid was carried out by naval aircraft on Engel aerodrome and dump. Direct hits were made, and fires started.

All machines returned safely.

A bombing raid on Oostcamp aerodrome was carried out by naval aircraft at noon on Jan. 30th. Many bombs were dropped on the three groups of sheds and hangars. A direct hit was observed on a hangar in the south group, from which a fire and a dense cloud of smoke arose.

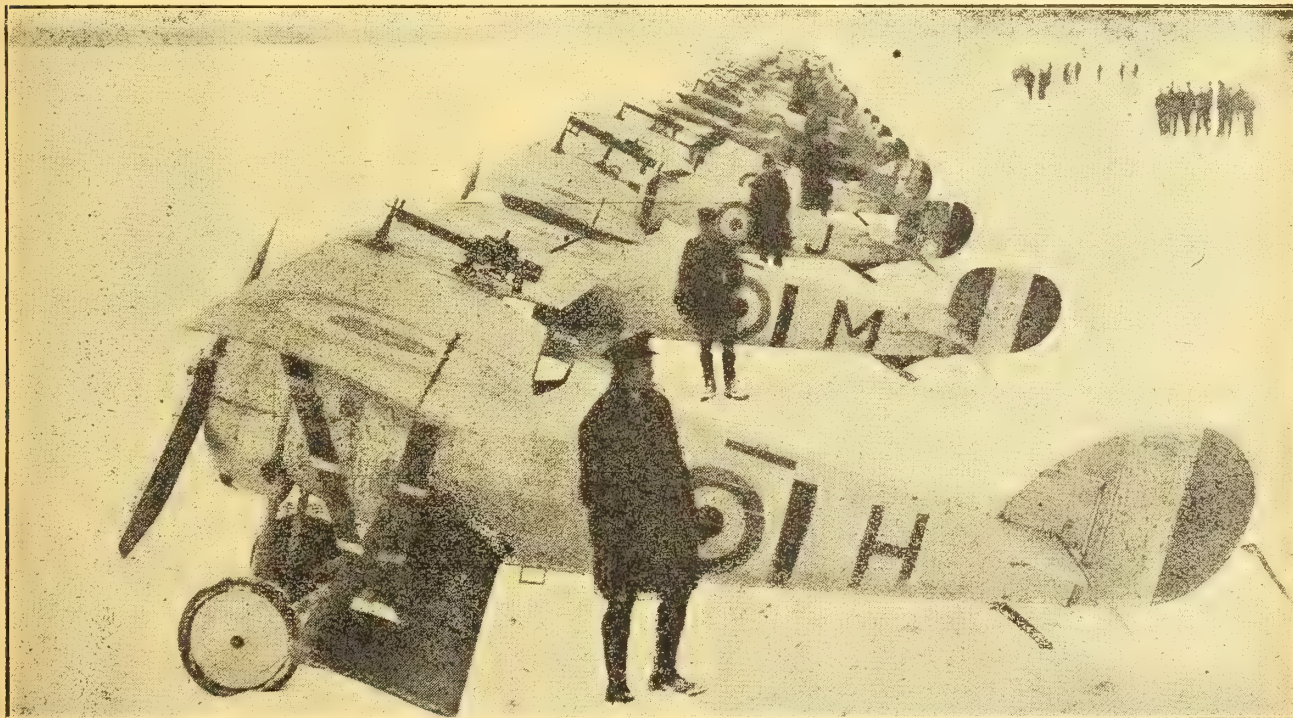
Two direct hits on the sheds north-west of Oostcamp village caused a fire in each case.

Several engagements with enemy aircraft took place, in which one was shot down out of control.

In the course of the usual patrols one enemy machine was destroyed, and two were shot down out of control.

One of our machines failed to return.

FEB. 3rd.—Naval aircraft bombed the Varsenaere aerodrome on the morning of Feb. 2nd. A fire was observed as the result of a direct hit.



IN SUNNY ITALY.—A fighting patrol of R.F.C. Nieuports ready to start from an aerodrome near the Italian Front, not the North Pole, or even on the Russian steppes.



An enemy machine engaged on a photographic reconnaissance was attacked and destroyed by our patrol machines.

All our machines returned safely.

FEB. 4th.—On Feb. 3rd naval aircraft carried out a bombing raid on the enemy aerodrome at Houttave (west by north of Bruges). Many bombs were dropped on objective.

During the day, in the course of aerial fighting, one enemy aircraft was destroyed and two driven down out of control.

Two of our machines have failed to return.

\* \* \*

Another communiqué issued on Feb. 4th, reporting that H.M. submarine E14 had been sunk on Jan. 27th in the Dardanelles, adds:—

Our aircraft, which were also sent to co-operate with E14, reported considerable anti-submarine activity in the Straits.

[Thus we have lost two monitors and a submarine, while the German "Breslau" sunk herself and the "Goeben" was somewhat damaged. A balance-sheet would be interesting.—Ed.]

#### THE CASUALTY LIST.

Reported Feb. 1st.

DIED OF ACCIDENTAL INJURIES.—Jeffries A. L., Actg. Air Mech., 1st Gr., F.27501.

Reported Feb. 4th.

MISSING.—Carr, Flt. Sub-Lt. J. N. T., R.N.

Youens, Flt. Sub-Lt. H. St. J. E., R.N.

Blyth, Flt. Sub-Lt. R. A., R.N.

Morris, Flt. Sub-Lt. E., R.N.

ACCIDENTALLY INJURED.—Simpson, Flt. Sub-Lt. J. C. F., R.N.

Drew, Prob. Flt. Officer O., R.N.

Jones, Prob. Flt. Officer C. A., R.N.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Page, Flt. Lt. J. A., R.N.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER.—Clark, Flt. Sub-Lt. J. G., R.N.

#### PERSONAL NOTICE.

##### DEATH.

LANGSTONE.—Prob. Flt. Officer Harold Langstone, R.N.A.S., who was killed while flying at a training school in France, was 19 years of age, and was the only son of Mr. and Mrs. C. Langstone, of Aylesbury. He was educated at Aylesbury Grammar School, and was articled to Mr. R. T. Stewart, the surveyor to the Aylesbury Rural District Council. At the age of 18 years he joined the Queen's Westminster Rifles, but was afterwards accepted as a Prob. Flt. Officer in the R.N.A.S. After passing through Greenwich College, he went to a British flying school in France, where he was killed.

#### MILITARY.

##### G.H.Q. COMMUNIQUÉS.

JAN. 29th, 9.35 p.m.—Our aeroplanes took advantage of the good visibility prevailing on Monday to carry out a large amount of work in conjunction with our artillery and to photograph the enemy's distant aerodromes and lines of defence. During the day they dropped 400 bombs on various objectives, including Roulers, Menin, and an aerodrome near Tournai.

Several thousands of rounds were fired from our machines at enemy troops in the trenches and on roads in the back areas.

Air fighting was continuous throughout the day, and resulted in two hostile machines being shot down and six others being driven down out of control.

Three of our machines are missing.

During the night of Monday-Tuesday our aeroplanes were unable to leave their aerodromes until 2 a.m., owing to a heavy mist. Nevertheless, over 6½ tons of bombs were dropped on the enemy's billets, railway stations, and trains, and two night-flying aerodromes near Ghent and Tournai.

All our machines returned from these bombing raids.

JAN. 30th, 9.15 p.m.—On the 29th instant fine weather continued, although visibility was not so good as on the previous day. Several reconnaissances of the enemy's back areas were carried out, a great many photographs were taken, and much work was accomplished in conjunction with our artillery.

Bombing attacks against the enemy's billets, ammunition dumps, and aerodromes were continued by our aeroplanes with the utmost vigour all day, while our low-flying machines engaged the enemy's troops with machine-gun fire.

The enemy's scouts were active east of the lines, and made many attacks upon our bombing reconnaissance and photographic machines.

Eight hostile aeroplanes were brought down in air fighting, and four others were driven down out of control. A German observation balloon was brought down in flames.

Three of our aeroplanes are missing.

Throughout the night of the 29th-30th instant the enemy dropped bombs on our forward areas. Our own machines actively attacked hostile billets and communications.

JAN. 31st, 9.8 p.m.—Another fine day. On the 30th instant enabled aerial activity to be maintained, but there was more mist

than on the preceding day, and observation for artillery was difficult.

Several long distance reconnaissances were carried out by our aeroplanes, in the course of which many photographs were taken.

A hostile aerodrome south of Ghent, a large ammunition dump east of Roulers, and the railway sidings at Courtrai were heavily bombed by us, and the enemy's troops, transport, and batteries in action were fired at from the air.

In air fighting four hostile machines were brought down, and four others driven down out of control; another hostile machine was shot down by anti-aircraft gun fire.

None of our aeroplanes is missing.

During the night of the 30th-31st inst. a few bombs were dropped by the enemy in our forward areas. Our own machines continued the bombing of the enemy's billets, ammunition dumps, and railway stations.

FEB. 1st, 9 p.m.—Thick mist prevented flying (? on Jan. 31st) except during two or three hours in the early morning.

In this period some work was carried out by our aeroplanes in conjunction with the artillery, and bombs were dropped on a hostile aerodrome north of Thielt (north-east of Roulers), and on an ammunition dump north-east of Courtrai.

No fighting took place.

On the evening of Jan. 24th a squadron of night-flying bombing planes left their aerodrome to bomb Treves Barracks and railway station and Thionville steel works. Altogether 889 lbs. of bombs were dropped on Treves, very good bursts being observed in the northern portion and in the centre of the town; and a large fire, which was observed later by other pilots, was caused in the north-eastern corner of the town. Machine-gun fire was directed at searchlights, trains, and buildings.

On Thionville steel works 1,120 lbs. of bombs were dropped. All the bombs burst, and large explosions were observed. Here also rounds from machine-guns were fired at searchlights, trains, and moving lights in the roads.

On the railway at Oberbillec, six miles south-south-west of Treves, 280 lbs. of bombs were dropped, and machine-gun fire was directed into villages in the Moselle valley. The same quantity of bombs was dropped on the railway station and junction at Saarbarg, ten miles south of Treves, causing large explosions in the town, and searchlights, trains, and lights in the town were fired at with machine-guns.

On the same evening a few bombing aeroplanes of a naval squadron attacked Mannheim and Thionville.

On the Badische Anile-und-soda Fabrik, the docks, and the town of Mannheim 1,344 lbs. of bombs were dropped. As a result of the bomb bursts in the factory dense clouds of smoke were seen to rise after the explosion. 1,344 lbs. of bombs were dropped on Thionville town, railway junction, and factories. Altogether 5,257 lbs. of bombs were dropped at an average height of 1,500 feet, while many rounds from machine-guns were fired with good effect, particularly on railway traffic in Treves.

The evening started with bright, clear moonlight, with a slight ground mist, but as time went on heavy banks of clouds came up from the north, and the mist became very thick, making flying very difficult. One pilot made four attempts before he reached and bombed his objective.

The anti-aircraft fire was heavy, but inaccurate.

FEB. 3rd, 9.25 p.m.—On the 2nd inst. the weather was fine, though with some mist and haze.

Several successful reconnaissances were carried out by our aeroplanes, and many hostile batteries were effectively engaged by our artillery with observation from the air.

Nearly four tons of bombs were dropped by us during the day on various targets, including the railway station and sidings at Valenciennes. Several thousand rounds were fired at parties of the enemy in their trenches and in back areas.

Five hostile machines were brought down in air fighting, and five others were driven down out of control.

One of our aeroplanes is missing.

On the night of the 2nd-3rd inst. the enemy's aerodromes and billets were bombed by our machines.

FEB. 4th, 8.58 p.m.—On the 3rd inst. the weather was fine, but with considerable ground mist. Reconnaissances were carried out by our aeroplanes, and many hostile batteries were engaged by our artillery, with observation from the air.

Nearly four and a half tons of bombs were dropped during the day on various targets, including the railway signals at Melle, south-east of Ghent, Ingelmunster, and Lichtervelde.

At night no operations were possible owing to the mist.

In air fighting five hostile machines were brought down and five driven down out of control.

One of our aeroplanes is missing.

#### WAR OFFICE COMMUNIQUÉS.

JAN. 31st.—The G.O.C. British Forces in Mesopotamia reports:—

On the night of Jan. 24th-25th hostile aeroplanes dropped bombs near Bagdad, causing some casualties in one of our hospitals.



# Firth's Aircraft Steels.

Mark "A" Non-Magnetic  
Bullet-proof Plates  
For Armouring Aircraft.

Thos. Firth & Sons Ltd.,  
Sheffield.

## VICKERS LIMITED.

Contractors to the  
WAR OFFICE AND ADMIRALTY.

Aviation Department, Imperial Court,  
Basil Street, Knightsbridge, S.W.3.

Telephone No.—  
KENSINGTON 6810 (2 lines).



Telegraphic Address—  
VICKERFYTA, KNIGHTS, LONDON.



On the following night our aeroplanes made successful attacks on Turkish headquarter units and aerodromes.

FEB. 1st.—The G.O.C. British Forces in Macedonia reports:—Our aircraft co-operated with the infantry, dropping bombs on the enemy's batteries near Nikolich (two miles north of the lake). One enemy machine was forced to land between the lines, where it was wrecked by our artillery fire.

Another hostile aeroplane was destroyed near Seres on Jan. 31st.

FEB. 2nd.—The G.O.C. British Forces in Italy reports:—There has been considerable aerial activity, in which four enemy machines have been shot down during the last week, while hostile bombing of our back areas has been frequent on suitable nights.

FEB. 3rd.—The G.O.C. British Forces in Palestine reports:—During the month of Jan. 12th enemy aeroplanes were destroyed in aerial combats.

#### HOME COMMAND COMMUNIQUÉS.

JAN. 29th, 3.30 p.m.—Latest police reports state that the casualties caused by last night's air raid in all districts visited by enemy aeroplanes were:—

	Men.	Women.	Children.	Total.
Killed .....	14	17	16	47
Injured .....	93	59	17	169

With the exception of one killed and seven injured, all the above casualties occurred in London.

Material damage was not serious.

JAN. 30th, 12.30 a.m.—Hostile aeroplanes crossed the coasts of Essex and Kent about 9.30 p.m., and some machines attempted to penetrate into London about an hour later.

Up to the present none has succeeded in penetrating the London defences, but some bombs have been reported as having been dropped in the outskirts.

The raid is still in progress.

JAN. 30th, 11.15 a.m.—A number of attacks were delivered against London by hostile aeroplanes last night between 10 p.m. and 12.30 a.m., but in no case did the raiders penetrate into the capital.

The first enemy machines crossed the Isle of Thanet at 9.30 p.m., and proceeded up the Thames Estuary towards London, but were all turned by gunfire.

About the same time three or four other raiders crossed the Essex coast; these also failed to penetrate the outer defences of the capital.

Meanwhile a single aeroplane, which crossed the Essex coast at 10.30 p.m., passed round the north and west of London and dropped some bombs on the south-western outskirts.

At the same time another enemy machine dropped bombs in the north-eastern outskirts without causing any casualties or damage.

Other aeroplanes which crossed the Kent and Essex coast between 10.25 p.m. and 10.50 p.m. were all turned back by gunfire at various places on their way to London.

A final attack, which was delivered across Essex by three or four machines between 11.50 p.m. and midnight, was equally unsuccessful.

Bombs were dropped at various places in Kent and Essex, but detailed reports of casualties and damage have not yet been received from these counties.

A few casualties occurred in the south-western outskirts of London.

About the same number of machines as on the previous night appear to have taken part in the raid—namely, 15.

A number of our aeroplanes went up, and several engagements with enemy machines are reported.

One of our pilots attacked a raider over the north-eastern outskirts of London, with the result that it dropped its bombs on open ground, and made off.

All our pilots returned safely.

3.30 p.m.—Police reports state that the casualties caused in last night's air raid were:—Killed, 3; injured, 10.

In addition to the above, the police state that it is feared that six other bodies are buried in the wreckage of a house.

FEB. 2nd.—Police reports show that the total casualties so far ascertained as having been caused by the air raid of the night of Jan. 28th-29th in all the districts visited by hostile aeroplanes are as follows:—

Killed: 58. Injured: 173.

Of the above casualties 30 persons were killed and 91 injured in a single building used as an air raid shelter. The work of removing the debris in this building has been greatly impeded by the dangerous state of the structure, and it is possible that a few more bodies may yet be discovered. The police have information of four persons in the district who have been missing since the raid took place, and whose bodies have not yet been found.

The total casualties caused by the raid of Jan. 29th-30th amount to:—

Killed: 10. Injured: 10.

#### THE CASUALTY LIST.

Reported Jan. 30th.

KILLED.—Bean, Lt. W. S., R.E., attd. R.F.C.

Cornforth, Sec. Lt. N. L., R.F.C.

Fenn-Smith, Sec. Lt. W. K., R.F.C.

Park, Sec. Lt. G. A., R.F.C.

Shephard, Brig.-Gen. G. S., D.S.O., M.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—

Browne, Lt. W. A., R. Innis. Fus., attd. R.F.C.

Chivers, Sec. Lt. W., R.F.C.

Crow, Sec. Lt. N. H., R.F.C.

Higginson, Sec. Lt. W. C. V., R.F.C.

Holman, Lt. G. C., R.F.C.

Pritchard, Sec. Lt. C. F., R.F.C.

DIED OF WOUNDS.—Browne, Sec. Lt. G. E., R.F.C.

Murray, Sec. Lt. W. D. G., R.F.C.

WOUNDED.—Davidson, Lt. C. R., High. L.I., attd. R.F.C.

Fetch, Sec. Lt. E. H. M., R.F.C.

Grant, Capt. F. D., R.F.C.

Howitt, Lt. F. D., A.S.C., attd. R.F.C.

Ivamy, Sec. Lt. W. G., R.F.C.

Rodmell, Lt. G. E., Buffs, attd. R.F.C.

Rowe, Sec. Lt. J. L., R.F.C.

MISSING.—Baker, Sec. Lt. E. T., R.F.C.

Madeley, Sec. Lt. C. N., R.F.C.

Ohrt, Sec. Lt. F. M., R.F.C.

Starfield, Sec. Lt. B., R.F.C.

Wylie, Sec. Lt. A. E., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER IN

GERMAN HANDS.—Stewart, Sec. Lt. R. J. G., R.F.C.

CANADIAN FORCES.—ACCIDENTALLY KILLED.—Freeman, Lt. H. P.,

Sask. Regt., attd. R.F.C.

Reported Jan. 31st.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Davis,

Lt. B. R., R. Fus., attd. R.F.C.

Thompson, Sec. Lt. H. V., R.F.C.

MISSING.—Hutchinson, Lt. A., L'pool R., attd. R.F.C.

AUSTRALIAN FORCE.—DIED OF WOUNDS.—Bell, Capt. J., A.F.C.

WOUNDED.—Finlay, Lt. G., A.F.C.

Roberts, Lt. K. A., A.F.C.

MISSING.—Willmott, Sec. Lt. F. B., A.F.C.

CANADIAN FORCE.—KILLED.—De Young, Lt. A. G., M.C., N.S.R.,

attd. R.F.C.

MISSING.—Skelton, Lt. E. K., Can. F.A., attd. R.F.C.

Reported Feb. 1st.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Tyzack,

Sec. Lt. E. D., R.E., attd. R.F.C.

WOUNDED.—Buchanan, Sec. Lt. R., Wilts R., attd. R.F.C.

MISSING.—Peile, Sec. Lt. A. H., R.F.C.

INDIAN FORCE.—WOUNDED.—Hereford, Sec. Lt. E. H., I.A.R.O.,

attd. R.F.C.

Owden, Lt. J. S., I.A.R.O., attd. R.F.C.

AUSTRALIAN FORCE.—MISSING, BELIEVED PRISONER IN TURKISH

HANDS.—Poole, Sec. Lt. A. A., Flying Corps.

Reported Feb. 2nd.

KILLED.—Beck, Sec. Lt. H. M., R.F.C.

Veale, Sec. Lt. A. A., R.F.C.

DIED OF WOUNDS.—Hurst, Sec. Lt. A. C., R.F.C.

MISSING.—Dogherty, Sec. Lt. F. W., R.F.C.

Paul, Sec. Lt. A. R., R.F.C.

Reported Feb. 4th.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Monta-

gue, Lt. P. D., Rif. Brig., attd. R.F.C.

WOUNDED.—Lick, Lt. C. H., R.F.C.

Whitehead, Sec. Lt. T. R., R.F.C.

Reported Feb. 5th.

KILLED.—Chance, Sec. Lt. E. G., R.F.C.

Reeves, Capt. H. G., R.F.C.

Thomas, Lt. J. B., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—

Bramley, Sec. Lt. S. L. J., R.F.C.

Goodwin, Sec. Lt. N. W., Mx. R., attd. R.F.C.

MacKay, Sec. Lt. J. R., R.F.C.

Raney, Sec. Lt. P. H., R.F.C.

Taylor, Sec. Lt. R. E., R.F.C.

WOUNDED.—Rowland, Sec. Lt. F., Buffs, attd. R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER IN

GERMAN HANDS.—May, Lt. L. B., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER IN

TURKISH HANDS.—Begg, Lt. M. G., M.C., Rif. Brig., attd. R.F.C.

INTERRED IN HOLLAND.—Thamer, Sec. Lt. Owen, R.F.C.

CANADIAN FORCES.—MISSING.—Beattie, Lt. J. O., B.C. Regt.,

attd. R.F.C.

\* \* \*

CASUALTIES AMONG MEN.

THE DATES ARE THOSE OF THE OFFICIAL LIST.

KILLED.

JAN. 26th.—R.F.C.—Chamberlain 108859 3rd Cl. Air Mech. J.

(Kirby Lonsdale).





# ARMSTRONG, WHITWORTH

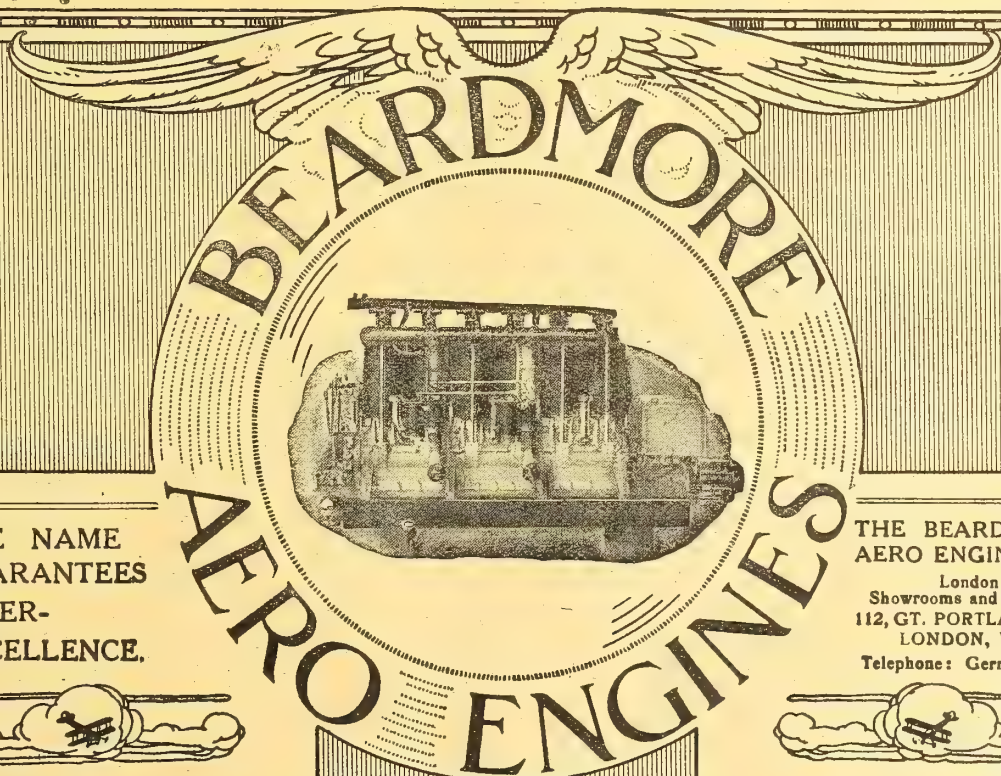
## AIRCRAFT WORKS,

### NEWCASTLE ~ UPON ~ TYNE.



TELEPHONE :- 500 GOSFORTH.

TELEGRAMS :- ARMSTRONG AVIATION,  
NEWCASTLE ~ ON ~ TYNE.



THE NAME  
GUARANTEES  
SUPER-  
EXCELLENCE.



THE BEARDMORE  
AERO ENGINE, Ltd.  
London  
Showrooms and Depots:  
112, GT. PORTLAND ST.,  
LONDON, W.1.  
Telephone: Gerrard 238.



C.O.C.



## DIED.

- JAN. 25th.—R.F.C.—Butterworth 66780 2nd Cl. Air Mech. A. (Clayton); Foy 106242 3rd Cl. Air Mech. J. (Preston); Macey 63905 2nd Cl. Air Mech. C. W. (Pentonville Road, N.); Skingle 69956 3rd Cl. Air Mech. A. H. (Clapton, E.).
- JAN. 26th.—Cameron 49659 2nd Cl. Air Mech. A. L. (Glasgow); Hutchins 78914 2nd Cl. Air Mech. W. (Wilkesden Green, N.W.); Wilson 38036 2nd Cl. Air Mech. R. J. (Wandsworth, S.W.).

## WOUNDED.

- JAN. 25th.—R.F.C.—Carr 11951 2nd Cl. Air Mech. G. P. (Gillingham); Dunning 106124 3rd Cl. Air Mech. J. (Paisley); Elders 26282 1st Cl. Air Mech. P. T. (Chiswick, W.); Ringrose 8230 1st Cl. Air Mech. R. (Walsall).
- JAN. 26th.—Tricker 64053 1st Cl. Air Mech. F. A. (Cardiff).

PREVIOUSLY REPORTED MISSING, NOW REPORTED MISSING, BELIEVED DIED.

- JAN. 25th.—R.F.C.—Samways 14262 1st Cl. Air Mech. W. (Kingston, Taunton).

PREVIOUSLY MISSING, NOW REPORTED BY THE GERMAN GOVERNMENT KILLED, OR DIED OF WOUNDS.

- JAN. 26th.—R.F.C.—Gilchrist 87458 2nd Cl. Air Mech. E. (White Abbey).

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF WAR IN GERMAN HANDS.

- JAN. 25th.—R.F.C.—Quinn 50506 2nd Cl. Air Mech. T. L. (Mountrath).

## PERSONAL NOTICES.

## DEATHS.

CHANCE.—Sec. Lt. Eric Godwin Chance, R.F.C., only son of Mr. H. Godwin Chance, editor and part proprietor of the "Gloucester Journal," was killed on Jan. 19th, aged 19. He was educated at Glyngarth, Cheltenham, and at Wellington College, Salop. At Wellington he was a member of the O.T.C., leaving with the rank of lance-corporal. Before reaching military age he acted as sergeant to the Cadet Corps of the Gloucester V.T.C. Subsequently he joined the Inns of Court O.T.C., and afterwards the Royal Flying Corps, in which he received his commission on July 6th last. In Sept. he got his "wings," and on Oct. 20th left for the front. On leaving Wellington he joined the editorial staff of the "Gloucester Journal" and "Citizen."

COWELL.—Sec. Lt. J. G. Cowell, Royal Fusiliers, att'd. R.F.C., who was accidentally killed whilst flying in Wiltshire on Jan. 28th, was the only son of Maj. E. J. L. Cowell and Nita, his wife.

DYER.—Sec. Lt. Herbert Arthur Dyer, R.F.C., who was killed while flying over the German lines on Dec. 7th last, was the third son of the late Dr. A. E. Dyer, Mus. Doc., who for 27 years was the musical director and organist of Cheltenham College. News of Mr. Dyer's death was dropped recently by a German aviator in the Allied lines, no details being given, though it is known that he was delayed by engine trouble on the morning of his death, and had to hasten in his attempt to overtake the rest of his patrol. The young officer was a musician from whom much was possible, being a Mus. Bac. of Oxford, and well known to provincial audiences as a conductor, and was as popular in the R.F.C. as amongst his friends. He joined the Army soon after the outbreak of war as a private, and after two and a half years' service in France was given his commission.

FLEMING.—Capt. Wilfrid Allan Fleming, M.C., Devonshire Regt. and R.F.C., who was killed in action on Aug. 10th, 1917, was the only son of A. S. Fleming, I.C.S. (retired), Millholme, Chagford, Devon. He was 27 years of age.

He received his commission in the Devons in 1910, and was promoted in 1912. In May, 1916, he had his captaincy, having in the preceding March received his "wings" in the R.F.C.

GARVER.—Cadet Roy O. Garver, R.F.C., an American, fell from a height of 150 ft. on Jan. 31st while flying on the south coast, and died from his injuries.

GREGORY.—Maj. William Robert Gregory, M.C., R.F.C., news of whose death in action has been received at Coole Park, Co. Galway, was the son of Lady Gregory, the well-known dramatist and writer on Irish folk-lore, and of the late Sir William Gregory, formerly Member of Parliament for Co. Galway, and Governor of Ceylon. He was born in 1881 and married in 1907 Lily Margaret, daughter of the late Graham Graham-Parry, of Cobham, Virginia, U.S.A.

NEVE.—Lt. Rupert Ernest Neve, R.F.C., who was killed in an aeroplane accident near London on Jan. 26th, aged 24, was a twin son of the late A. H. Neve, J.P., and Mrs. Neve, of Maidenhead. Early in the war he enlisted in the Public Schools Battalion of the Royal Fusiliers, and subsequently was gazetted to the Shropshire Light Infantry, but after a short interval transferred to the R.F.C. Last March, after six months' flying in France, he was severely wounded during an aerial fight, but brought his machine safely into the British lines. After a long period in hospital he returned to duty, and acted as instructor at

an aerodrome in England. He was recently reported fit for active service.

REEVES.—Capt. H. G. Reeves, R.F.C., who was killed on active service on Jan. 24th, was the youngest son of Mr. and Mrs. C. Reeves, The Grange, Binfield, Bracknell. He was 20 years of age.

ROWLEY.—Sec. Lt. Charlie E. Rowley, R.F.C., who was accidentally killed in an aeroplane collision on Jan. 19th, was the only son of Mr. and Mrs. H. R. Rowley, and grandson of the late Charles Rowley, Nether Stowey, Bridgwater. He was 19 years of age.

SIMSON.—Lt. Herbert Simson, R.F.C., who was born in New Zealand, was the youngest son of Mr. and Mrs. Hector Norman Simson, of New Zealand. His three brothers are Capt. Donald Simson, who served in Gallipoli; Lt. Hector Simson, South African Forces; and Corpl. Rupert Simson, N.Z.F.A. He was returning to New Zealand when he died at sea on Jan. 24th.

YOUNG.—Sec. Lt. J. S. Young, R.F.C., was killed while flying in Scotland in Feb. 2nd. He was 28 years of age, and came from Glasgow.

## ENGAGEMENTS.

OLIEFF—MILES.—An engagement is announced between Sec. Lt. Percy Hy. Olieff, R.F.C., and Alice Maude (Trixie), youngest daughter of Mr. and Mrs. Charles Hy. Miles, of Reading, Berks.

LOVEMORE—GOULD.—The marriage of Sec. Lt. Norman B. Lovemore, R.F.C., and Nowell, only daughter of Mr. Lionel Gould, of The Gable House, Bilton, near Rugby, will take place very quietly at 2 on Tuesday, Feb. 12th, at Holy Trinity Church, Sloane Street, S.W.

SANCEAU—RUTHERFORD.—The marriage arranged between Capt. R. J. Sanceau, R.F.C., and Miss Rutherford will take place, leave permitting, at the parish church, Reigate, on Saturday, Feb. 9th, at 12.15. There will be no reception, but all friends will be welcome at the church.

SWAIN—HILLMAN.—The marriage arranged between Lt. Claude Swain, R.F.C., son of Capt. Swain, R.A., of Beech Grove, Ryde, Isle of Wight, and Iris, elder daughter of Mrs. and the late Mr. Bernard Hillman, of 33, First Avenue, Hove, will take place on Feb. 16th at the Catholic Church of the Sacred Heart, Norton Road, Hove, at 2.30. There will be no reception or invitations sent, but all friends will be welcome at the church.

## MARRIAGES.

KAVANAGH—MARTIN.—On Feb. 2nd, at Long Ditton Parish Church, Capt. Henry Richard Kavanagh, Royal Irish Fusiliers and R.F.C., only son of Hope Kavanagh, of Gorakpur, India, and grandson of William Henry Kavanagh, V.C. (Lucknow), was married to Sylvia Eleanor, younger daughter of James Martin, J.P., Surrey, of Bellair, Surbiton, by the Rev. Percy White Collard, M.A., Vicar of St. Augustine's, Honor Oak Park, assisted by the Rev. A. W. Parry, M.A., Chaplain to the Forces.

WEST—GREEN.—On Feb. 1st, at St. Gabriel's Church, Cricklewood, N.W., Sec. Lt. Alec. B. West, R.F.C., elder son of Mr. C. A. West, of Brighton, was married to Dorothy Enid, elder daughter of Mr. and Mrs. Chas. H. Green, of Kingston House, Anson Road, Cricklewood, N.W., by the Rev. B. West, uncle of the bridegroom, assisted by the Rev. J. Noel Gill, vicar of the parish.

## BIRTHS.

BONHAM-CARTER.—On Feb. 1st at Harvieston, Tring, the wife of Maj. (temp. Col.) Ian Malcolm Bonham-Carter, Fusiliers and R.F.C., of a daughter.

JONES.—On Jan. 31st, at St. Chad's, Edgbaston, Birmingham, to Eveline, wife of Lt. A. R. Jones, R.F.C., a son.

PYM.—On the 27th Jan., 1918, at Wothorpe, Stamford, Irene (née Tootell), wife of Capt. Julius T. Pym, E. Sur. R. and R.F.C.—a daughter.

Missing.—Lt. G. C. E. Smithett, R.F.C., was reported missing Oct. 12th, 1917. If any officer or man can give any information, or if relatives of prisoners of war in Germany would ask for news, same would be most gratefully received by Mr. Smithett, 4, The Elms, Sunderland.

\* \* \*

Lt. Dudley A. Page, Cheshire Regt., att'd. R.F.C., has been missing since Aug., 1917. Any information will be thankfully received by Mrs. Page, 140, Hill Lane, Southampton.

\* \* \*

The Royal Warrant dealing with the pay of officers and allowances for officers' children was issued on Jan. 28th. The warrant and the accompanying schedules can be obtained from the usual official publishers.

\* \* \*

A fire occurred at a large building of a Norfolk aerodrome just before three o'clock on the morning of Feb. 4th, and as a result an air mechanic in the Royal Flying Corps named Herbert William Langdown was burned to death, while five others—H.



# GWYNNES

LIMITED

CONTRACTORS TO H.M. ADMIRALTY AND WAR OFFICE.

SOLE LICENSEES AND MANUFACTURERS IN THE BRITISH EMPIRE  
OF THE

"CLERGET" PATENT AERO ENGINES.



WORKS & OFFICES: { CRISP ROAD, HAMMERSMITH, W.6. } LONDON.  
                                  { CHURCH WHARF, CHISWICK, W.4. }

TELEPHONES: 1910 HAMMERSMITH (3 lines).  
                  1780 CHISWICK (3 lines).

TELEGRAMS: "GWYNNE, LONDON."

## THOMAS ROBINSON & SON, LTD.

ROCHDALE, ENG.

HIGH GRADE

**26in. Band Sawing Machine  
For Aircraft Manufacture**

With Canting Table  
and Locking Device.

A Handy Saw for Small Joinery Work.

*Type MN.*

*Further particulars on request.*



A. Elder, A. E. Cox, C. Leuke, A. Crowther, and W. Taylor—are in hospital suffering from severe burns.

The men were at work in a large building, when an explosion occurred, and in a moment the place was in flames. The fire spread rapidly to a smaller building. Firemen were soon on the scene, but several hours elapsed before the outbreak was subdued. Subsequently, the body of Langdown was found under a piece of fallen corrugated iron.

\* \* \*

It is stated that the two British Flying Officers recently sentenced to ten years' hard labour—for dropping leaflets re-printing President Wilson's peace terms in the German lines—are Lts. Wookey and Scholtz, R.F.C.

Lt. H. C. Wookey, is well known in Bristol. He lived at Brecknock Road, Knowle, and was an accomplished cricketer.

After serving for some time in the 4th Gloucesters he obtained a commission in the R.F.C. He was reported as missing on Oct. 17th last, but his father shortly after that date received a postcard from him. Since then nothing has been heard until the long silence was broken by the news of the sentence. Bristol members of Parliament are to be asked to take action.

\* \* \*

The "Times" correspondent writing from the British front on January 29th says:—

Recent British bombing raids into Germany have created a new terror for the inhabitants by reason of the liberal use of machine-guns. Instead of flying at a great altitude, as is the custom of Hun raiders over England, the British machines swoop down daringly on their objectives, and attack anti-aircraft defences in addition to dropping high explosives. The steel works at Thionville, in the region of Southern Germany, and various railway junctions which feed the munition plants, have been attacked repeatedly in this way.

On the night of the 14th inst. our airmen fired nearly two thousand rounds at searchlights and trains in railway stations. and the moral effect of this unexpected attack, following the explosion of a number of bombs, plainly demoralised the German gunners and searchlight crews. Their fire although heavy was very wild, and none of our machines was harmed.

Our return visit two nights later was made in very unfavourable weather; yet despite a thick mist, which increased when the British aeroplanes arrived over the Thionville region, they dropped bombs on the railway sidings and searchlights.

A stronger attack was made on the night of the 21st and 22nd on Thionville steel works and Bernsdorf railway sidings. Our airmen unloaded a number of the heaviest bombs, in addition to those of lighter weight, and fired their machine-guns into munition factories and at the searchlights, which tried to put up a dazzling barrage. At the same time other airmen were attacking the railway junction south of Metz with good results.

#### FRANCE

##### OFFICIAL COMMUNIQUÉS.

JAN. 29th.—On January 27th a German aeroplane was brought down and three others fell damaged in their lines. On the same day our squadrons dropped 6,000 kilogrammes (about six tons) of explosives on the railway stations of Conflans (west of Metz), the factories in the region of St. Privat (north-west of Metz), and various aviation grounds in the enemy zone.

JAN. 30th.—During the 29th two German aeroplanes were brought down by our pilots, and three fell in their own lines badly damaged, after fights in the air.

JAN. 31st.—Four enemy air-squadrons crossed the lines north of Compiègne and reached Paris, flying at a very great altitude and favoured by the clearness of the atmosphere.

They approached Paris and its suburbs from the north and north-east, dropping in succession bombs on several suburbs. They then flew over Paris, chiefly on the right bank of the Seine, where, in a few moments, they dropped almost all their bombs, causing a fairly considerable number of casualties, especially among women and children.

Two hospitals were hit and several buildings burned and damaged.

The number of killed is about 20 and of the wounded about 50.

Several air fights were fought north of the capital. One German aeroplane was brought down and its two occupants taken prisoners. One French aeroplane had to land, its occupants being wounded.

A further report will be issued later giving the number of our casualties.

A later communiqué states:—

It is now known that our losses as the result of the air raid last night were 36 dead, including 22 in Paris, and 14 in the suburbs, and 190 injured, including 114 in Paris and 76 in the suburbs. A large number of the victims were women and children.

On Jan. 29th, in the day time, one of our aeroplanes, manned by Capt. Vuillemin and Sub. Lt. Lecreux, bombarded from a very low altitude the station of Thiaucourt (south-west of Metz), where a great fire broke out.

During the 30th a German aeroplane was brought down by our pilots, and three others fell in their lines after encounters.

It is confirmed that three enemy machines which were reported to have been badly damaged on Jan. 9th and 25th were in reality brought down.

ARMY OF THE ORIENT.—An enemy aeroplane was brought down in the same region, Lake Doiran.

FEB. 4th.—During the period between Jan. 21st and Jan. 31st inclusive nine German aeroplanes were brought down by our pilots in air fights and four by the fire of our anti-aircraft artillery.

In addition, during the same period 15 enemy aeroplanes, seriously damaged, were seen to fall out of control in their own lines.

ARMY OF THE ORIENT.—Greek aviators bombarded the railway station of Milotkovo, in the Vardar valley.

\* \* \*

An official statement issued on Feb. 1st gives the number of victims in the raid of Jan. 30th as 252, classified as follows:—

KILLED.—45—31 in Paris, 14 in the suburbs. Among the dead are 11 women and five children.

INJURED.—207—131 in Paris, 76 in the suburbs.

The "Morning Post" correspondent writes on Feb. 1st as follows:—

There has been much speculation as to the exact force of the raiders. Four groups were identified, echeloned between altitudes of 4,000 ft. and 12,000 ft. Instead of succeeding one another, these squadrons started together, each group at a different altitude. Altogether, there were not more than 25 machines. Some, apparently, were not of recent type, as, for instance, the Aviatik brought down at Chelles, east of Paris. The average weight of explosives carried by each was about a quarter of a ton, so that the total discharged over Paris and the suburbs amounted probably to seven tons. The German official statement as to 14 tons is certainly bluff.

At the Municipal Laboratory it is estimated that 180 bombs were dropped, and those which failed to explode are now being carefully examined. They are of all kinds—small ones for killing human beings, and big ones—incendiary bombs of various calibres—for the destruction of buildings. The smallest bombs recovered weigh about 20 lbs., the biggest 220 lbs. They explode by percussion, but there is nothing new in their composition.

\* \* \*

A Reuter's message of Feb. 1st states:—

The newspapers state that the enemy machine brought down was a small aeroplane from the Aviatik workshops, with a Benz motor of 225 horse-power. The machine had on board four bombs weighing from 10 to 12 kilogrammes each and two bombs of 50 kilogrammes. A kilogramme is about 2 1-5th lbs.

It was manned by two young officers, a flight-sub-lieutenant, aged 20, and an observer-sub-lieutenant aged, 25 years, both of them barons. On being searched no paper was found upon them except a written order to bomb Paris, but to spare the hospitals and schools. With a smile they explained that the order was worded in this manner in order to save them from being shot.

\* \* \*

The "Temps," Paris, Jan. 30th, announces that the Duc de Chevreuse has been killed as the result of a flying accident while training as an aviator.

\* \* \*

The special correspondent of the "Daily Chronicle" writing from Paris, on Jan. 30th, says:—

A Gotha has been brought down by the French aviators on the beach near Calais, and its occupants taken prisoners. This Gotha was one of a number that raided Calais, dropping bombs in the streets and causing a certain amount of material damage. The number of victims has not yet been announced.

During one night last week the Germans lost nine aeroplanes between the Somme and the North Sea. Several large Hun machines had been sent to bombard Dunkirk, but were caught by the French anti-aircraft guns, two being brought down on Belgian territory and two being forced to land in the Dunkirk region. One big machine, which dropped in the flooded Dixmude plain, was a Friedrichshafen Gotha of the latest type, carrying an officer, a sergeant, and two privates, and armed with two machine guns on revolving platforms. It had two 260 h.p. Benz motors, and its wings measured 85 ft. from tip to tip.

When descending the crew threw out all the Gotha's instruments, and after landing tried to burn their machine, but failed owing to the damp.

[Gotha is evidently being employed as the generic term for big German aeroplane.—Ed.]

\* \* \*

The "Daily Express" correspondent, Mr. H. Patrick Devitte, writing from Geneva on Feb. 1st, says:—

A message from Bonfol, on the frontier, states that one of the German squadrons that bombed Paris returned through Alsace, hotly pursued by Allied aviators. It is reported that one Gotha was brought down near the Swiss frontier, and that another was seen to fall in flames in the German lines.

\* \* \*

It is announced in Paris that air-raid shelters for use both day and night are being established in all parts of the city, use



# Repetition Work

During the last three years the Government's unparalleled demands on producers generally have impelled vast changes in the majority of factories.

To obtain the necessary productive power, Plant, Tools, Machinery and Methods have had to be overhauled, re-organised and largely added to, bringing a wider knowledge and a new experience.

These conditions apply particularly to the House of Suckling who, to-day, with greatly multiplied facilities, invite enquiries for all kinds of Repetition Work from the Motor and Aeroplane Industries.

*The*  
**KINGSWAY Creed**  
"TO MAINTAIN  
QUALITY AND RE-  
DUCE COST BY  
SPECIALISATION AND  
MASS PRODUCTION."

— **WILLIAM SUCKLING & SONS,** —  
Kingsway House, Albion Street, Birmingham.  
London: Morley House, Holborn Viaduct, E.C.1

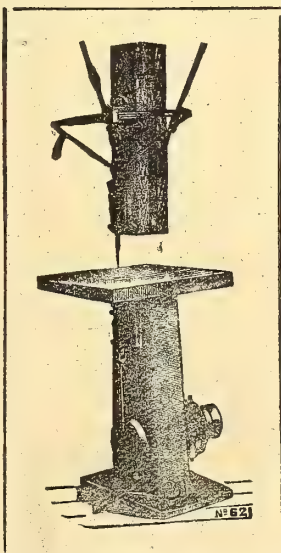
## SUCKLING

1096

**SAGAR**

## FRET SAWING MACHINES

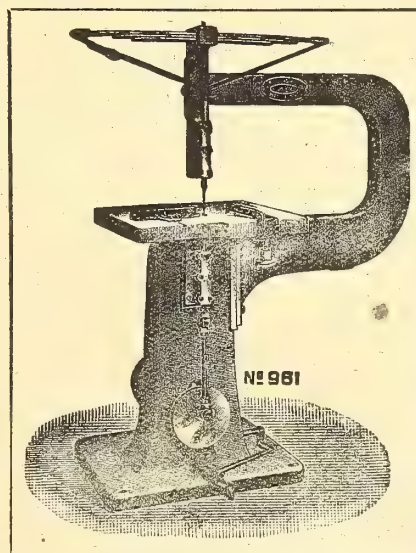
### Suitable for Aircraft Work.



Made with Fixed or  
Canting Tables, and  
:: suitable Boring ::  
Apparatus if required.

Fuller particulars on  
request.

We make several other Wood  
Working Machines suitable for  
Aeroplane Builders, and shall be  
pleased to quote prices, etc., on  
receipt of enquiry.



**J. SAGAR & CO., Ltd.,** Sawmill Engineers, **HALIFAX, Eng.**  
Canal Works,  
LONDON OFFICE: 60, Watling Street, E.C.



being made more particularly of the underground railway stations, crypts, etc. The lighting of Paris is to be further reduced.

### GERMANY.

#### OFFICIAL COMMUNIQUÉS.

JAN. 29th.—Lively flying activity led to numerous duels in the air. We brought down yesterday 13 enemy aeroplanes and one captive balloon.

French aviators continue their attacks on our hospitals. Several times during the month of December they dropped bombs on the hospital buildings of Bethel (?), and during the last few days they have attacked the buildings of Labry (east of Conflans).

Bombs were dropped yesterday on London and Sheerness with good effect.

One of our bombing squadrons during the night of Jan. 26th and 27th dropped 21,000 kilogrammes (about 21 tons) of bombs on Castlefranco, Treviso, and Mestre with good effect. Big fires were seen from a long distance.

JAN. 30th.—Our aviators carried out successful attacks on England and on the north coast of France. Bombs were dropped on London and Southend, as well as on Dunkirk, Gravelines, and Calais. Eight enemy aeroplanes and two captive balloons were brought down in aerial fighting yesterday.

JAN. 31st.—On Christmas Eve and during the month of January enemy aviators, in spite of our warning, have again dropped bombs on open German towns outside the region of operations. Thanks to our measures of defence, the losses and damage were slight.

As a reprisal, 14,000 kilogrammes (about 14 tons) of bombs were dropped during the night of Jan. 30th and 31st on the city of Paris, in the first systematic attack from the air.

FEB. 4th.—During the last two days 18 enemy aeroplanes and two captive balloons were brought down in aerial fights and by gun-fire.

\* \* \*

A Reuter's message from Zurich on Jan. 30th says that:—

A telegram from St. Gall reports from Rosenberg, on Lake Constance, that the noise of a tremendous explosion, accompanied by gunfire, was heard in the direction of Friedrichshafen at two o'clock a.m., on Jan. 30th, and at the same moment a huge column of fire was seen and ascended a considerable height.

The telegram says it is probable an air attack on the Zeppelin works has taken place.

\* \* \*

A Reuter's message from Amsterdam on Feb. 1st says that according to the "Deutsche Tageszeitung," Lt. Scholtz and Lt. Wookley, the occupants of an aeroplane of the 11th Squadron, which was shot down on Oct. 17th, south-west of Cambrai, were sentenced on Dec. 1st by a German Court-martial to 10 years' penal servitude for dropping enemy leaflets.

\* \* \*

The "Lokalanzeiger" reports that at the Johannisthal aircraft works the number of strikers has increased from 1,500 to 1,900, and at the Albatros works from 218 to 697.

[Evidently not much of a strike, unless the number of Albatros strikers is mistranscribed at 697 in mistake for 6,970. Or perhaps it was only the canteen staff who went on strike.—Ed.]

### ITALY.

#### OFFICIAL COMMUNIQUÉS.

JAN. 29th.—Our flight dominated the air everywhere. Numerous hostile machines were attacked and repulsed, while 10 of them were brought down by our aviators and two by the French.

JAN. 30th.—Enemy aircraft attempted many reconnoitring and offensive actions, but was effectively met by our machines and the anti-aircraft fire, which during the two days accounted for 17 enemy machines.

JAN. 31st.—Our aviators and those of our Allies have attained fresh brilliant victories, bringing down seven enemy aeroplanes in all.

During an effective bombardment of the principal enemy lines of communication to the Plateau of Asiago our machines brought

down one aeroplane which attempted to attack them. Our chasing squadrons brought down two machines between Costalunga and Monte Melago, Asiago Plateau. English aviators brought down four machines between Ormelle, on the left bank of the Piave, and Oderzo, on the Livenza.

FEB. 1st.—Last night enemy aircraft dropped some bombs on Bassano, on the Brenta where it enters the plain, causing a few wounded and little damage.

FEB. 2nd.—The activity of our air squadrons during their scouting expeditions led to several aerial fights, in the course of which two enemy machines were brought down near Turcio (south of Asiago) and in the Brenta Valley.

Yesterday towards nightfall enemy aircraft bombarded Treviso and various localities in the region between the Brenta and the Piave. A few men were wounded, and damages of little importance to some buildings are reported.

FEB. 3rd.—Favoured by the fine weather, our aerial activity against enemy military objectives was considerable, with effective co-operation of the seaplanes of our Navy. Our flights bombarded yesterday the points of concentration and the road crossings in the lines of communication of the enemy on the Asiago Plateau; our bombing machines damaged last night works of the aerial cable line between Caldonazzo and Mount Rovere (Val Sugana).

Eight hostile machines were brought down during yesterday. One of them was hit by anti-aircraft artillery near Marano (Val Lagarina), another fell in the neighbourhood of Primolano (Brenta), six more shot down between Vittorio Veneto and Nervesa (Piave) by British aviators, who set fire also to a captive balloon along the Piave.

FEB. 4th.—Our aircraft carried out intense bombing of the enemy's rear lines. The traffic on the railway lines east of the Piave was effectively disturbed last night by our airships operating with those of our Navy; all returned safely to our bases.

The enemy aviators gave vent again to their mischievous impulses, bombarding Venice and other towns of the Venetian Plain, where the peaceful population is densest and the military objectives of least importance.

Padua, Treviso, and Mestre were repeatedly attacked yesterday before dawn, and towards sunset and during last night. As usual, the greatest damage was caused to private property, and the largest number of casualties is reported amongst civilians; the civil hospital at Treviso was hit. Altogether there were eight killed and 10 wounded among the population; neither damage nor casualties are reported at Venice.

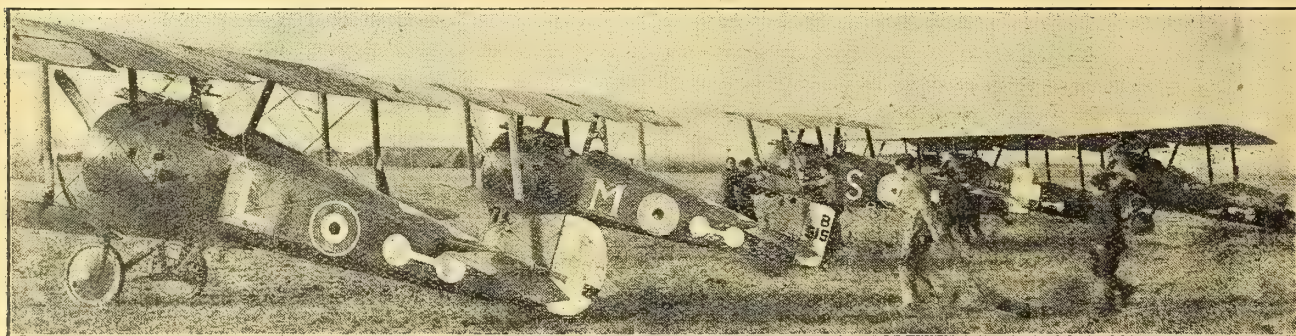
\* \* \*

An Italian semi-official communiqué of Jan. 29th says:—

The enemy continues to repeat night air raids on the cities of the Venetian Plain with the pretext that these cities represent operation bases or places for the concentration of war material. Without doubt, given the character of this struggle between nations in every city, in every village of every country, soldiers and establishments of a military character are to be found, but there is no one who does not see or understand that these presumable military objectives represent only the smallest part of the inhabited area on which the hostile aircraft drop their bombs.

So it always happens that the damage is greatest and the victims much more numerous among the civil population than among the military element which it may be convenient to keep in inhabited places. Also in the last raid there are women and children among the dead and wounded, in a much higher proportion than the military casualties, and the greatest damage was done to small workmen's houses, which were totally ruined by the explosions.

The real scope which the enemy aims at with these operations, called military ones by him, is to frighten the population, which, however, though in danger, though suffering for the damage, continues to show serene courage, and an exemplary spirit of abnegation which are the most noble and effective means of co-operation in the work of preparation and defence carried out by the civil and military authorities.



ON THE ITALIAN FRONT.—A Patrol of Sopwith Camels getting ready to start.



## IMPORTANT NOTICE

TO ALL

### Engineering Firms and Aircraft Manufacturers.

We beg to call your attention to the following work that we specialise in, and solicit your valued enquiries. We can quote prices and deliveries that will be attractive to you for all classes of work, or to any special specification and requirements for all work in connection with Ministry, Admiralty, or Air Board.

**DROP STAMPINGS & FORGINGS FOR ALL PURPOSES. IN STEEL OR IRON. BRASS OR BRONZE (HOT STAMPINGS).**

**SAND OR DIE CASTINGS IN ALL METALS.**

**SHEET METAL PRESSINGS.**

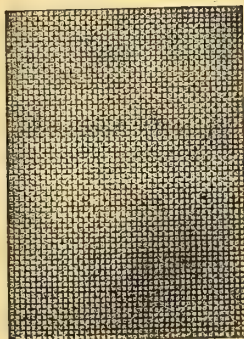
**SOFT GREY IRON CASTINGS; MALLEABLE IRON & CAST STEEL CASTINGS. WOOD WHEELS AXLES; SWINGLE TREES; CHAIN WORK; LEATHER WORK, AND GENERAL IRON WORK FOR ALL TYPES GENERAL SERVICE VEHICLES.** Also

**COMPONENT PARTS in Steel Forgings or Stampings for Aeroplane Work, including A.G.S. No. 158 Shackles; Steel Stampings, sizes A, B, C, D, E & F.**

**THE ANGER MANUFACTURING & SUPPLY COMPANY, LTD.**  
**PRESTON, Lancashire.**

Telephone : 1033.

Telegrams : "Brakjuster, Preston."



## AIR BOARD STANDARD PETROL GAUZE.

WOVEN WIRE CLOTH  
IN ALL METALS AND  
IN ALL MESHES AND STRENGTHS.

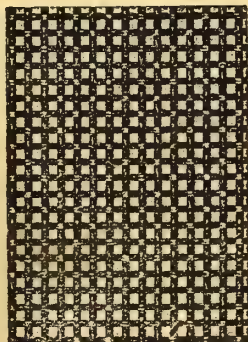
MANUFACTURED BY

**N. GREENING & SONS, LTD.** ESTABLISHED 1799.

LONDON WAREHOUSE—

**16 FINSBURY STREET, E.C.2.**

Telegrams—"SETSCREW, FINSQUARE, LONDON."  
Telephone No.—LONDON WALL 1082.



**WORKS - WARRINGTON.**



Rumour has it that the blood-red German squadron which has usurped the La Comina (Pordenone) camp of historic interest is an ex-London-strafer concern, thought expert in frightening the civilian population and upsetting the ecclesiastical mind.

It is unfortunate for them that they should have met a few old "friends" from the London-Dover-Dunkirk district who, "according to Diaz," seem up to them.—T. S. H.

#### BELGIUM.

##### OFFICIAL COMMUNIQUÉ.

FEB. 4th.—A German aeroplane was brought down in our lines by British aviators.

\* \* \*

A message from Flushing dated Feb. 4th states that Allied aviators bombarded Zeebrugge this morning from 5 to 8 o'clock. German aviators replied with great force, and many duels were observed. Two machines were seen to fall in flames, but their nationality is not known.

Three large fires were seen to break out in Bruges Harbour, where the Germans store munitions.

#### TURKEY.

##### OFFICIAL COMMUNIQUÉS.

JAN. 31st.—Five enemy aeroplanes unsuccessfully dropped bombs on Kifri. One aeroplane crashed down and was burnt.

JAN. 30th.—An English seaplane, Shore type (Short type?), was forced by machine-gun fire to land at Nagara. Its crew were taken prisoners. The machine has been salvaged in undamaged condition.

#### HOLLAND.

The "Handelsblad" reports that two German aviators in uniform flew over the Dutch frontier near Oldenzaal on Jan. 29th, landed near Ochtrup, and, after destroying their machine, departed on bicycles to be interned.

#### GREECE.

Greek aeroplanes have carried out successful reconnaissances on the Salonika front, attacking enemy posts, observation camps, and trenches with machine-gun fire from a height of 200 to 400 metres.

#### U.S.A.

Mr. Baker made a comprehensive statement on Jan. 28th before the Senate Military Committee with regard to the activities of the American Army during the war. He said that the United States would have 500,000 men in France early this year, and 1,500,000 more men ready to go to France in 1918. "Our problem," he said, "was to get over to and at the enemy." He was telling no secret when he said that ships were the crux of the problem.

Every soldier who needed a rifle, he declared, had one. Defending the lack of Lewis machine-guns, he reiterated the statement that General Pershing did not want Lewis guns for the ground forces, but for aviation.

#### INVASIONS OF ENGLAND.

A party of sportsmen hunting for game on Jan. 31st, in a wood near Wickford, Essex, came across the complete wing of a German aeroplane.

The wing, which was of large dimensions and had the appearance of having been struck by shells, was found about two miles from the spot where an enemy aeroplane came down in flames on Jan. 28th.

[Possibly the "wing" was an aileron or an elevator flap.—Ed.]

A London Coroner held an inquest on Feb. 1st on the bodies of eight of the 14 victims of the panic which occurred on Jan.

## PYROMETERS

For Heat Treatment of all parts of  
Aeroplanes and Aeroplane Engines.

Radiation Pyrometers, catalogue P. 17.

Thermo-couple Pyrometers and Electrical Resistance Thermometers, catalogue P. 19.

POST FREE ON REQUEST.

**FOSTER INSTRUMENT CO.,**  
LETCHEWORTH, HERTS, ENG.

## OFFICIAL ACCEPTANCE TESTS

#### LAND MACHINES.

S.P.A.D.	Avro
Sopwith	Armstrong
B.E.	Whitworth
Short	D. H. 4.
Curtiss	Handley-Page
Mann, Eserton	Bristol
M. Farman	Vickers
H. Farman	Nieuport
Morane	Supermarine, &c.

#### SEAPLANES.

Short, Sopwith, America Boats, F.B.A.  
Boats, Curtiss Boats, Norman-Thompson,  
A. D. Boats, &c.

*Private Aerodromes  
Surveyed and Pilots'  
Reports Furnished.*

### DELIVERY AND EXPERIMENTAL FLIGHTS ON LAND MACHINES & SEAPLANES.

COMPLETE REPORTS FURNISHED.

Rates on application to

THE

**PRODGER - ISAAC**

AVIATION COMPANY

(C. B. Prodger and Bernard Isaac),  
166, Piccadilly, London, W.1.

Telephone: Gerrard 278 (2 lines.)

Telegrams: "Aeromnla, Piccy, London."

#### CLIFFORD B. PRODGER

J. LANKESTER-PARKER,  
and other Pilots.

Approved Admiralty Pilots  
—for Acceptance Trials. —

#### INSURANCE.

WE are now in a position to quote low rates, through our brokers at Lloyd's, for the Insurance of Aircraft during ACCEPTANCE TRIALS AND DELIVERY FLIGHTS with an excellent and most comprehensive Policy. May we quote you for your new contracts?

SPECIAL ARRANGEMENTS with Sub-Contractors for HANDLEY-PAGE Type Land Machines or "AMERICA" Type Flying Boats



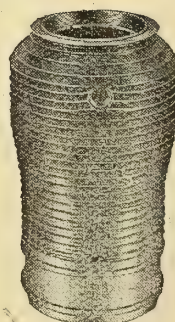
## THE Beverley Engineering Works

### Aeroplane Cylinders

Clerget

Le Rhône

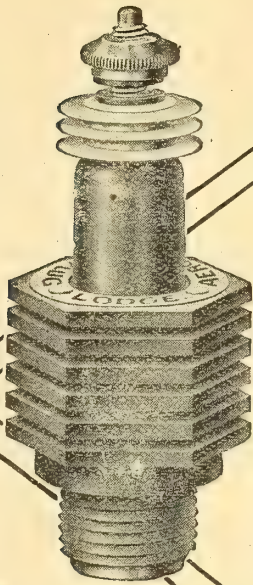
Gnome



WILLOW AVENUE, BARNES, LONDON.

'Phone: Putney 478





# LODGE

## AERO PLUGS FOR AEROPLANES

*Illustrated Catalogue and Price List now ready.*

The **LODGE SPARKING PLUG CO., Ltd.**,  
RUGBY.

*(Under Gov't Control.)*



SPECIALISTS IN ELECTRICAL TRANSMISSION AND DISTRIBUTION



CABLES

OVERHEAD LINES

SWITCHGEAR

TRANSFORMERS ETC

*The Illustration shows a section of  
a 20,000 volt three-phase overhead*

## ELECTRIC POWER TRANSMISSION LINE

*lately completed by us for an outlying  
Government Mine.*

*The cheapest method of delivering power  
to Works, etc., in country districts.*

12, UNION COURT, OLD BROAD ST., LONDON, E. C. 2.

Telegrams  
"JUNO"  
LONDON

**JOHNSON AND PHILLIPS LTD**  
ELECTRICAL ENGINEERS & CABLE MAKERS  
**CHARLTON, LONDON, S.E. 7.**

Telephone  
400  
GREENWICH

BIRMINGHAM CARDIFF GLASGOW MANCHESTER NEWCASTLE-ON-TYNE PORTSMOUTH  
206, Corporation St. 9, Park Place, 159, W. George St. 251, Deansgate 44b, Blackett St. Cleveland Rd Gosport

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



28th at the entrance to a shelter following the maroon warning of an impending air raid.

The Coroner said that the deaths appeared to have been due to panic almost entirely on the part of persons who might be called foreigners, or who were of foreign extraction. One could have hoped that people living in London would by this time have regained their powers of self-confidence and control—qualities which would have enabled them to act very differently and not in a way unworthy of men and more nearly approaching the ways of the lower animals.

A police superintendent said that there was a discharge of warning rockets, and some people—aliens chiefly—apparently thinking that these were bombs, appeared to have lost their heads and rushed for the shelter. In the rush some of them dropped articles they were carrying, and when they stooped to pick them up they were quickly knocked over. He saw the people there, and was amazed at the number of strong, able-bodied young men, nearly all aliens or of alien type, and it was these people who were largely responsible for the trouble. Continuing, the witness said:—"I am proud to say that we have not had the slightest trouble with English people, but we have very great trouble with the foreign element."

The Coroner remarked that one effect of these raid shelter rushes was to increase the number of deaths among the children, who caught a chill. "What I do," he added, "is to go to bed. If I am killed, I am killed, and I am in bed all ready to lay out."

In the case of the six-months-old child of a Russian, the mother said the baby was knocked out of her arms and she lost it.

It was stated that among the property found on the various bodies were 384 £1 notes, 23 £5 notes, three £10 notes, a £50 war savings certificate, and some Russian bank deposit receipts.

The jury added to their verdict a recommendation that the authorities should not allow persons using shelters to take with them chairs or other articles of furniture, and to inform them that if they did such articles would be destroyed.

\* \* \*

Another London Coroner on Feb. 1st held inquests on the bodies of 28 victims of the air raid of Jan. 28th. The people were killed when taking shelter in a building which was hit by a bomb.

The jury returned the usual form of verdict. They added that it would be well if police-whistle warnings were stopped in favour of maroons, and also said that, as no modern building

## AEROPLANE



## ACCESSORIES

7 Years' Experience.

## OFFICERS' UNIFORMS DRY CLEANED AND TAILOR PRESSED.

### PRICE LIST.

Caps, soft ...	...	each, 6d.
Tunics ...	...	each, 2/-.
Breeches ...	...	pair, 1/-.
Slacks ...	...	pair, 1/-.
British Warm ...	...	each, 3/-.
Fur-lined Flight Coat,	each, 6/-.	
Leather Waistcoat	each, 1/6.	
Puttees ...	...	pair, 6d.
Gloves, Fur ...	...	pair, 6d.

Time, 3 days.

Carriage paid one way exceeding 10/-.

**W. WARE & CO.,**  
GRAYS AND TILBURY DYE WORKS,  
**GRAYS, ESSEX.** Tel. TIL, 536.

## Air Supremacy!

GIVE your friends who are interested in Aviation a copy of

## FOUR SONGS of the AIR SERVICE

Lyrics by ED. LOCKTON.

Music by ERIC COATES.

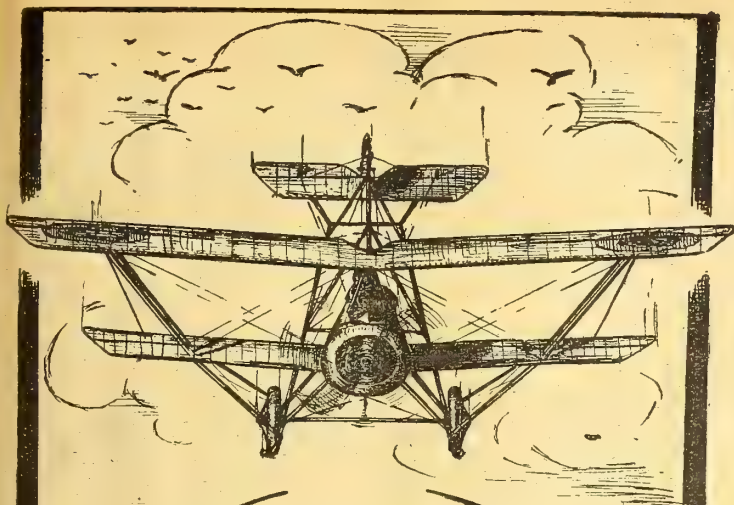
... they will enjoy singing these invigorating songs, written in their own vernacular

- No. 1. "Ordered Overseas"
2. "Five-and-twenty Bombers"
3. "Billy"
4. "The finest job of all"

Complete **3/-** net cash

**WEST & CO.,**  
12, MOOR STREET  
(CLOSE TO PALACE THEATRE),  
LONDON - - W. 1.





If You Want  
TO LEARN TO FLY,  
Write to  
THE

# CAMBRIDGE

SCHOOL OF FLYING  
and Aerodrome Co., Ltd.,  
306, St. Andrew's St., Cambs.,

## TUTORS

of  
Piloting and Aero-engineering  
for their

### 1918 PROSPECTUS.



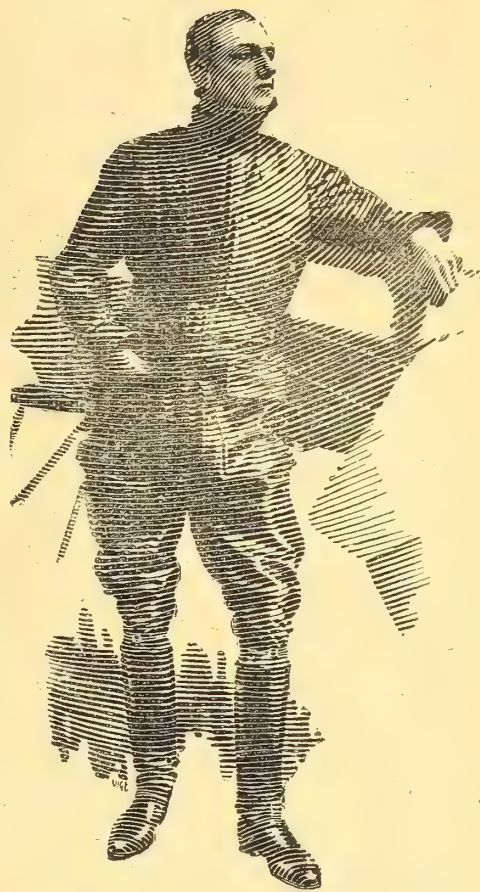
Best  
Staff.

Best  
Equipment.

Tel: Cambs. 5 and 1086.

Wire: "Carbon", Cambs..

## Where Flying Men are fitted out.



## For Fight and Flight.

A man flies—and fights—at his best when fitly clad for the work. Many an airman would say "when Dunhill-clad," acclaiming Dunhills' leadership in the new outfitting science of kit making for flying men.

Who better—who indeed so well—qualified to pioneer, to blaze the trail, as the house whose fame as motoring outfitters is old as motoring itself, armed as that house must be with the knowledge and skill so accumulated, equipped with the fullest resources

Here you have the simple reason why Dunhills are always a step further than the furthest of its rivals—and flying men play for stakes far too high to ignore the significance of that fact.

**LEATHER COMBINATION SUIT,**  
lined soft, snug camel fleece.

		to knee.	to ankle.
Tan Leather	...	9 gns.	10 gns.
Black "	...	10 "	11 "

WRITE FOR A CATALOGUE.

# Dunhill's

LIMITED,

2, Conduit Street, London, W. 1.

MANCHESTER:  
90 and 92, Cross Street.

GLASGOW:  
72, St. Vincent Street.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



was perfectly safe from bombs, it would be better for people to stay at home. If there were air raid shelters, however, there ought to be some inspection by public bodies.

\* \* \*

The Home Secretary, in a written reply to Sir George Greenwood, M.P., states that sound warnings were urgently called for by many public authorities and by a large section of the public in London, and there can be no doubt that they have saved life by the prompt clearing of the streets. Sirens have been tried, but they cannot be heard because of noise of the traffic in those streets where the danger would be greatest, and rattles are less effective than the police whistles already used. It would be very undesirable to change the system of warning, especially now that most people have learned to recognise the sound of the maroons.

\* \* \*

An inquest was held on Feb. 2nd on six further victims of the stampede which occurred outside an air raid shelter on Monday evening last. The deaths thus far number fourteen, all being Jews. An inspector said that any number of people were knocked down after getting in through dropping bedding, chairs, and other furniture. People seemed to think the maroons were bombs, and went mad accordingly.

\* \* \*

At the inquest on the body of Jane Allport, 22, a book sewer, who was injured in the shelter where 30 persons lost their lives on Monday night, an acting superintendent said that so far as the authorities knew there was no building that was immune from the direct hit of a bomb. It was a pity that all these people did not stay in their own homes. The shelter where these people lost their lives was very popular, because people knew they would be well looked after and provided with refreshments.

#### REMINISCENCES OF 'GERMAN EAST.'

General Smuts, who was elected a member of the Royal Geographical Society a year ago, delivered on Jan. 29th, before a large audience in the Central Hall, Westminster, an address in which he described the campaign in East Africa. The following references to aircraft occurred in his address:—

He had often stopped to wonder at the native state of mind over the doings of his army, which must have been not unlike what was told of one of his simple countrymen on whose farm an aviator descended with an aeroplane, never seen before, and who calmly walked forward to shake hands with the heavenly visitant, whom he believed, in Old Testament story, to be none other than the Lord!

The Navy had played a very active part in the African cam-



**Sankey**

**Patent Steel Wheels**

Unbreakable, easiest to detach, easiest to clean.

**Joseph Sankey & Sons, Ltd.**

Hadley Castle Works,  
Wellington,  
Shropshire.



# ROK

## ROOFING

facilitates the speedy erection of Hangars by combination with our famous "Belfast" Girder Principals in

**ANY CLEAR SPAN  
UP TO 100 FEET.**

**BRITISH & BEST**

Write for Booklet "R."

48

**D. ANDERSON & SON, Ltd., Lagan Felt Works, Belfast; and Roach Road Works, Old Ford, London, E.**

## THE USE OF NAYLOR'S Aero Varnishes

WILL ENSURE A  
PERFECT FINISH

Many years' experience combined with up-to-date methods and scientific selection of materials ensure the production of varnishes unexcelled for durability and reliability.

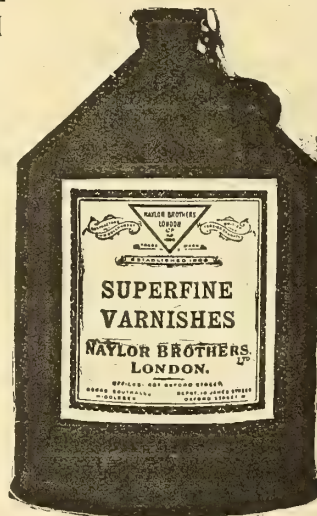
Some Specialities  
for Aero Work

Woodfillers, Stains, Air  
Screw Varnish, Spar  
Varnish, Float Varnish,  
White Copal Finish for  
Dope, Enamels, Engine  
Paints, Etc., Etc.

Free Samples for trial  
on application.

**NAYLOR BROTHERS (London) Ltd.**  
Contractors to all Government Departments.

Offices: 407/9, OXFORD ST., LONDON, W. Works: SOUTHALL MIDD.





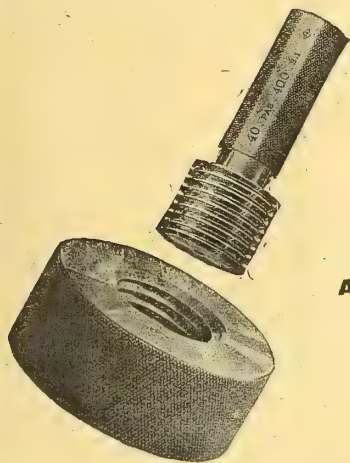
# LIMIT GAUGES

AS SUPPLIED TO

## A.I.D.

AND

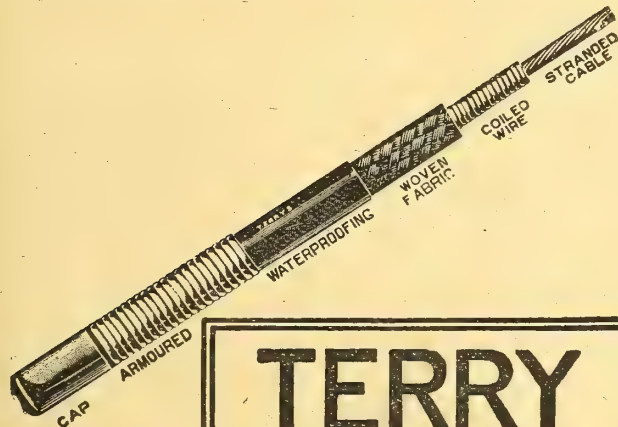
THE MINISTRY OF MUNITIONS.



**ABSOLUTE  
ACCURACY.**

Particulars from

**LEO. RIPAUT & CO.,** 64a, POLAND ST., LONDON, W.1.  
Wires—Ripault, London. 'Phone—Gerrard 7758.



# TERRY

control mechanisms and coverings

—a flexible dampproof covering—not easily chipped or cracked—one colour all through, and made to any shade of colouring.

May be fireproofed by armouring  
Send to-day for sample card.

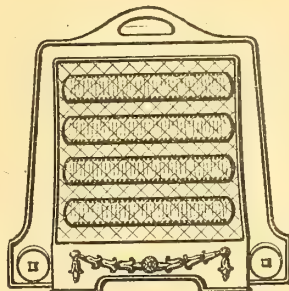
**HERBERT TERRY & SONS LTD.**  
The Spring and Presswork Specialists  
**REDDITCH :: ENGLAND**

Telephone—  
**61 Redditch**



# BELLING ELECTRICAL ACCESSORIES

**AIRCRAFT  
Manufacturing  
Purposes.**



**ELECTRIC FIRE.**

OFFICE PATTERN. List No. 617.

An ideal fire for small offices, waiting rooms, passages, etc. We have also supplied a large number to Aerodromes for general heating. Numerous other designs are available.

PRICE 35/-

Dimensions—Height 17½ in.,  
Width 17½ in., Depth 5½ in.



**ELECTRIC**

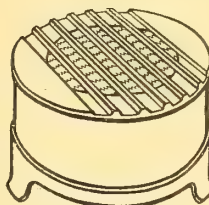
**AIR WARMER.**

List No. 960.

A reliable low temperature heating appliance, suitable for work rooms, etc. Can be used in any position without risk of fire.

PRICE 25/-

Dimensions—Length 15½ in.,  
Width 6½ in., height 4½ in.



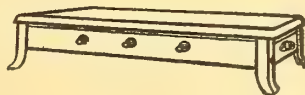
**ELECTRIC**

**BOILING RING.** (List No. 7.

This will do all the same operations as an ordinary g-s ring. Used for heating glue pots, and when loaded at 250 watts can be attached to any electric lampholder.

PRICE 15/-

Diameter 7 in.



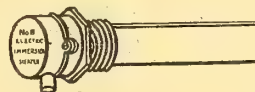
**ELECTRIC**

**HOT PLATE.** List No. 18.

Useful for keeping food warm, and also for drying purposes of all kinds.

PRICE 100/-

Size 36 in. by 18 in.



**ELECTRIC**

**IMMERSION HEATER.**

A reliable appliance for heating water, oil and other liquids. Can be easily fitted to existing tanks, etc.



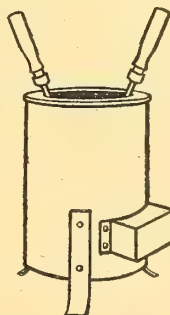
**ELECTRIC**

**ENGINE WARMER.**

For placing under engine in cold weather to prevent freezing. They are quite gas and fireproof.

PRICE 40/-

Size 12 in. by 7 in.



**ELECTRIC**

**SOLDER POT.**

Type A.

This is the latest system for heating ordinary soldering irons, and consists of a pot of molten solder into which the irons are placed for a short time till heated.

PRICE 65/-

Dimensions—Outside diam. 8 in.,  
inner pan 5½ in. diam. at top,  
Depth 7 in.

All the above prices are subject  
to an advance of 25 per cent.

Our Catalogue illustrates many other special appliances we make  
for Manufacturing Purposes, Munition and Factory Work,  
Hospitals, Mess Rooms, etc.

**BELLING & CO.,** MANUFACTURING  
ELEC. ENGRS.,  
DERBY RD. WORKS, MONTAGUE RD., EDMONTON, LONDON, N.18

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



paigns, and one of the most fascinating episodes of the war was the search for the lost "Konigsberg," its discovery in the Rufiji river, and its ultimate destruction by seaplane and specially built monitors in its impenetrable lair. The "Konigsberg," though destroyed, made her voice heard all over that vast country, for her big naval guns, pulled by teams of 400 natives, accompanied the enemy armies in all directions, and along with other naval guns and smuggled howitzers made the enemy stronger in artillery in many a fight than our forces.

#### A RECORD OF RECORDS.

Those who are interested in the performance of aeroplanes, airships and balloons, and who wish to compare present-day performances with the records of the past, will find a mine of information in the little book entitled "Les Records Mondiaux de l'Aéronautique." This book, which sells at 3.50fr., or post free 3.75fr., has been compiled by M. G. Le Grand, who is a well-known French specialist on aeronautical questions. M. Le Grand has in this book collated in one work all the world's records for free balloons, airships and aeroplanes, basing his work on the official documents of the Aero Club de France. No other publication of this sort has been issued up to the present day.

As an appendix to this list of records, which in itself makes quite a stout volume, M. Le Grand has added a section entitled "Comment servir dans l'Aéronautique Militaire" in which he has included everything that can interest French soldiers either at the front or in training respecting transference to the fifth arm. Owing to the general importance of aviation in all belligerent countries, this information will also be of considerable interest to those concerned with Military aviation, especially to those engaged on Staff work, as they can thus obtain in a handy form a comparison of the French methods of dealing with Air Service Personnel and our own methods. Readers in France who wish to obtain the book can do so from M. G. Le Grand, 32, Faubourg Montmartre, Paris. Those in this country can obtain it for 3s. 6d. from the William Dawson Publishing Co., Ltd., Rolls House, Breams Buildings, E.C.4.

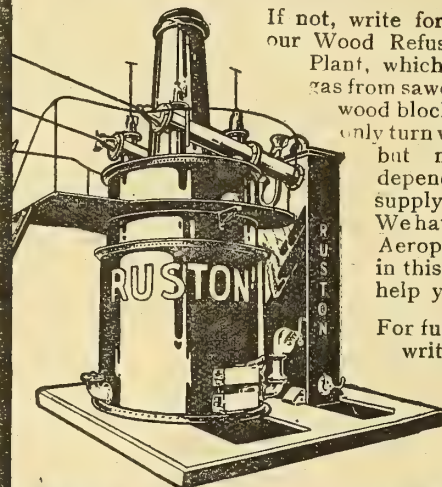
#### THE ALBATROSS.

The following letter to the Editor of the "Morning Post" is of considerable interest:—

Sir,—Professor Graham Bell, the inventor of the telephone, discussing flight in his address to the Empire Club on "The Substance of My Latest Research," says: "Consider the albatross,

## What do you do with your Waste Wood?

Turn  
it into  
Power & Profit?



If not, write for particulars of our Wood Refuse Suction Gas Plant, which will generate gas from sawdust, chippings, wood blocks, etc., and not only turn waste into profit but make you independent of coal supply.

We have helped other Aeroplane factories in this way. May we help you?

For fuller particulars write, on business note paper, mentioning AEROPLANE, to Sole Makers:

**RUSTON, PROCTOR & CO. LTD. LINCOLN**

## HIGH-CLASS ALUMINIUM CASTINGS

FOR ALL TRADES.

We Specialise in Aluminium Cylinders and General Aero and Motor Engine Castings,

## CAST IRON CYLINDERS

Water and Air-cooled for Aero & Motor Engines

ALL THE ABOVE CASTINGS  
TO GOVERNMENT SPECIFICATION. I

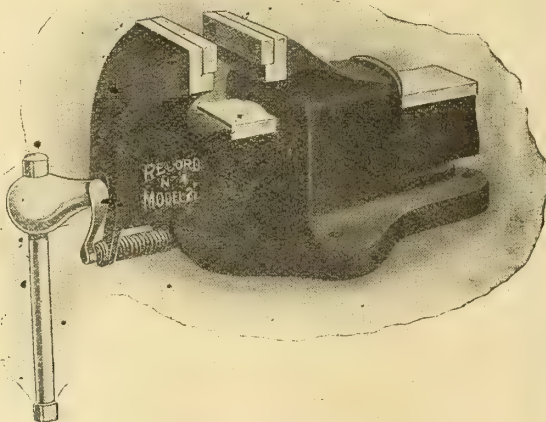
**WILLIAM MILLS, LTD.,**

Atlas Works :: Grove Street,

**BIRMINGHAM.**

ALUMINIUM AND IRON FOUNDERS.

## BENCH VICES



PROMPT DELIVERIES.

**C. & J. HAMPTON, LTD.,**

SHEFFIELD.

TELEGRAMS: "VICES, SHEFFIELD."

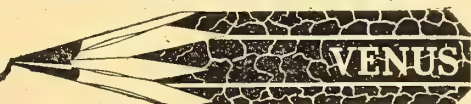


# VENUS PENCILS

**V**ENUS PENCILS are made to meet exacting demands—the demands of men whose special work calls for a flawless tool—hence the wide range, the gritless, smooth black lead, the selected timber of Venus Pencils.

17 Grades, 6B (Softest) to 9H (Hardest) Blacklead—also Copying:  
OF ALL STATIONERS, STORES, ETC., THROUGHOUT THE WORLD.

"VENUS," 173/5, LOWER CLAPTON ROAD, E.5.

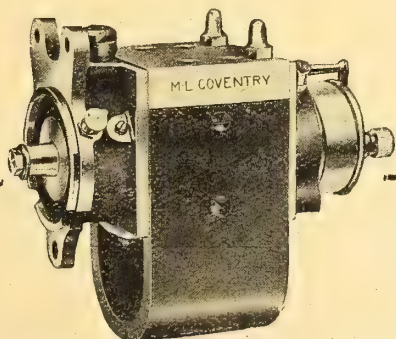


## All-British Magnetos

**M-L MAGNETOS** are lighter, smaller yet stronger than any pre-war magnetos of same electrical capacity.

They are of British design and built by British labour in a British-owned factory. They have been supplied in large numbers for work of National importance.

The M-L Magneto Syndicate, Limited, Victoria Works, Coventry.



M-L Type  
A.D.S. for  
Rotary Aero  
Engines.

### CHANGE OF NAME!!

## ACETYLENE EQUIPMENT

The Pioneers of  
the Oxy-Acetylene  
Industry.

Formerly the  
Acetylene Illuminating  
Co., Ltd.

## COY., LTD.

MANUFACTURERS AND SUPPLIERS OF  
OXY-ACETYLENE EQUIPMENT & ACCESSORIES OF ALL KINDS

### High Pressure System:

Dissolved Acetylene, Cylinders  
and Gas Blowpipes, &c.

**D. A.**

### Low Pressure System:

Acetylene Generators, Purifiers, Safety  
Valves, Blowpipes, &c. (Trade Mark  
"Endazzle.")

Address:

**268 & 270, SOUTH LAMBETH ROAD,  
LONDON, S.W.8.**

Branches in all Industrial Centres.

Telephone—Brixton 2171 (3 lines). Telegrams—Endazzle, London.

### AIRCRAFT DEPARTMENT

THE WORLD'S LARGEST MANUFACTURERS OF ALL KINDS OF ENGRAVED METAL GOODS.

**British Metal (Kingston) Ltd.**

*The Factory.*

Kingston-on-Thames

### DIALS & INSTRUCTION PLATES

MADE IN ANY METALS,  
IVORY, IVOROID, BONE, ETC.  
ANY QUANTITIES, WORDING, DESIGN,  
SIZE, SHAPE OR COLOURS.

### COMPLETE SHEET METAL AIRCRAFT COMPONENTS

RIVETED, SWEATED, BRAZED OR WELDED.

**R.E.8, F.E.2B.&D, B.E.2C-D-E,  
SE5, DE H6.**

RESIDENT A.I.D. EXAMINER.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



which, without the movement of its wings, can overtake a ship even when the bird is travelling against the wind. The flying of these birds is a problem open to science. The question is: 'How do they do it?' In a book on "Animal Locomotion," by the late Professor Pettigrew, F.R.S., St. Andrews, whose researches on aeronautics fifty years ago appear to have been altogether lost sight of in the sudden glare of modern invention, I find the following observations on the flight of the albatross.

A careful examination of the movements of skimming birds has led me to conclude that, by a judicious twisting or screw-like action of the wings at the shoulder, in which the pinions are alternately advanced towards and withdrawn from the head in a manner analogous to what occurs at the loins in skating without lifting the feet, birds of this order can not only maintain the motion which they secure by a few energetic flappings, but, if necessary, actually increase it, and that without either bending the wing or beating the air. The forward and backward screwing action of the pinion referred to in no way interferes with the rotation of the wing on its long axis, the pinion being advanced and screwed down upon the wind, and retracted and unscrewed alternately. As the movements described enable the sailing bird to tilt its

body from before backwards or the converse, and from side to side or laterally, it may be represented as oscillating on one of two centres, the one corresponding with the long axis of the body, the other with the long axis of the wings. Between these two extremes every variety of sailing and gliding motion which is possible in the mariner's compass when set upon gimbals may be performed; so that a skimming or sailing bird may be said to possess perfect command over itself and over the element in which it moves.

Capt. Hutton, in his book "On Some of the Birds Inhabiting the Southern Ocean," says, as regards the albatross:—

I have sometimes watched narrowly one of these birds sailing and wheeling about in all directions for more than an hour without seeing the slightest movement of the wings, and have never witnessed anything to equal the grace of this bird as he sweeps past, often within a few yards, every part of his body perfectly motionless, except the head and eye, which turn slowly and seem to take notice of everything: "Tranquil its spirit seem'd, and floated slow, Even in its very motion there was rest."

Dumfries.

J. C.-B.

## MAKE MONEY BY WRITING

**£50 PRIZE.** Send postage (2d.) for particulars and copy of "How to Earn Money while Learning, How to write for Newspapers and Magazines." Practical and comprehensive Correspondence Courses—Fiction and Articles, etc. Expert Literary Directors. Constructive criticism. Beginners taught how to make work saleable. Exceptional testimonials. Address:

"EDITORIAL" (Dept. A.),  
22, CHANCERY LANE, LONDON, W.C.2.

## CLABOUR-WESTBAY

" FOR "

**2.B.A. Bolts—A.G.S. 103**

Entire Output at present absorbed  
—by Government Requirements.—

**W. A. Clabour, Westbay & Co.,**  
KIRKSTALL, LEEDS. Ltd.

Phone: Headingley 709. Telegrams: Clabour, Kirkstall.

## UNDERCARRIAGES

**A. V. ROE, TYPE 506.**

**FOR IMMEDIATE DELIVERY.**

ENQUIRIES INVITED FOR WOODWORK AND METAL SPARES.



**JOSEPH G. NAVARRO,**  
AERONAUTICAL ENGINEER,  
BRANSTON ROAD,  
**BURTON-ON-TRENT**

Of special  
interest to  
Government  
Contractors  
*Not Mill furnishing or Hydraulic*

**J.B. BROOKS  
& CO. LTD.**

Contractors to the Admiralty and War Office,  
Air Board, Ministry of Munitions, etc.,  
and the Leather Specialists with the  
Largest Works, Finest Equipment,  
Best Facilities and Widest Experience  
in the Trade. Invite enquiries  
for

Articles. Parts, Fitments,  
and Cases of

**LEATHER**

Address  
**J.B. BROOKS & CO. LTD.**  
104, Criterion Wks. Bham

1051



# Blackburn

## AIRCRAFT

On  
ADMIRALTY  
and  
WAR OFFICE  
List.  
BLACKBURN  
AEROPLANE  
and MOTOR  
CO., LTD.  
Olympia,  
LEEDS

**Efficiency of design and construction.**

*Steele's Advt. Serv.*

**TO ENSURE ECONOMY AND EFFICIENCY**

**SPECIFY**

**VICTOR  
BLADES**

**FLEXIBLE  
BACK**

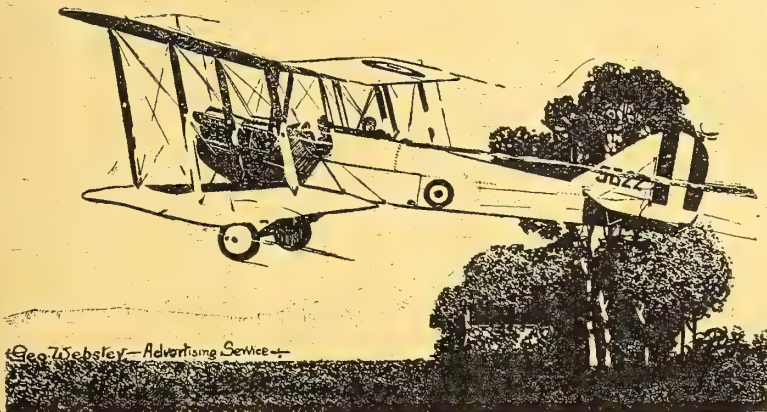


**EVERY  
BLADE  
COUNTS.**

**VICTOR SAW WORKS**

**(CANADA) LIMITED,**

**283, WEST STREET, FINSBURY CIRCUS, E.C.2.**



*Geo. Webber - Advertising Service -*

**METAL COMPONENTS  
FOR  
AIRCRAFT.**

**Undercarriages  
Tail Units  
Tubular Framework.**

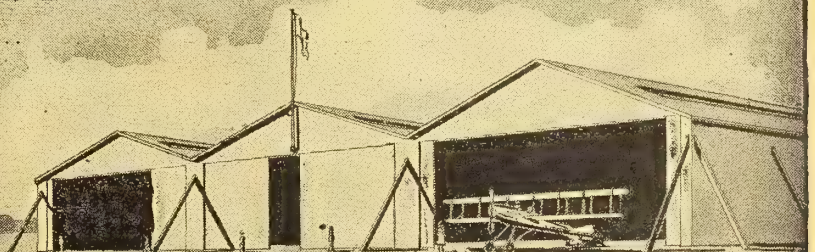
**THOMPSON BROS. (Bilston) Ltd.  
AERO. DEPT., Bilston, Staffs.**

**T.W. PALMER & CO.**

**MERTON ABBEY IRONWORKS  
LONDON · SW · 19**

**ESTIMATES  
FREE**

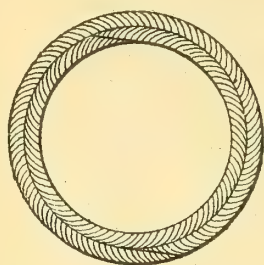
**DESIGNERS MANUFACTURERS AND  
ERECTORS OF EVERY DESCRIPTION OF  
AIRCRAFT BUILDINGS  
TEMPORARY OR PERMANENT**



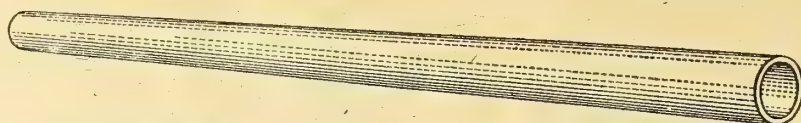
**WORK · CARRIED · OUT · TO · OUR · OWN · OR · CUSTOMERS · DESIGNS**

**KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.**





Patent No. 4704/15.



**McGRUER SPARS**  
are **THE ACME** of  
**STRENGTH and LIGHTNESS**

Particulars from :-

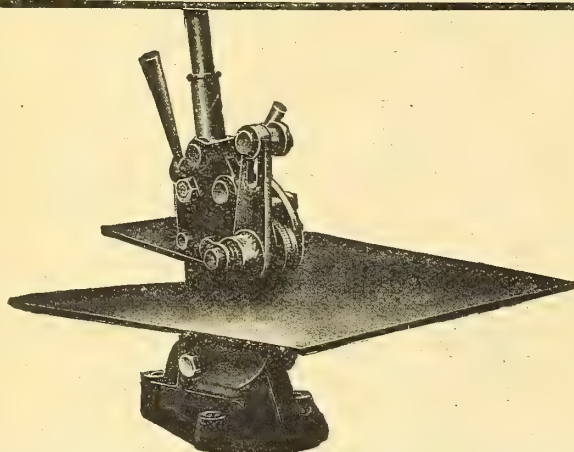
**McGRUER BENTWOOD HOLLOW SPAR Co.,**  
Commercial Wharf, Lambeth, LONDON, S.E.1.

**THE MIDLAND MOTOR CYLINDER CO. LTD.**  
**SMETHWICK** **N<sup>R</sup>. BIRMINGHAM**  
TELEPHONE—289 SMETHWICK TELEGRAMS—RAFWORK, SMETHWICK

**SPECIALISING IN**

**AERO ENGINE CYLINDERS IN IRON AND  
ALUMINIUM TO PASS ALL GOVT. TESTS**

**WE HAVE THE LARGEST OUTPUT OF AERO-ENGINE  
CYLINDER CASTINGS OF ANY BRITISH MAKER**



**'TANGENT'**

**HAND  
SHEET SHEARING MACHINE  
PATENT.**

**SELF-FEEDING, FAST CUTTING.**

**STEEL, 3/16 SOFTIER METAL, 1/4."**

Write for Descriptive Pamphlet and Prices.

**MONTGOMERY, SMITH & Co., Ltd.,**

**PATENTEES AND MANUFACTURERS,**

**TANGENT WORKS, KEYNSHAM, SOMERSET.**

Are YOU interested in Flying? If so, why are YOU not taking

**The Nottingham Flying and**  
**Correspondence Schools, Ltd., Course?**

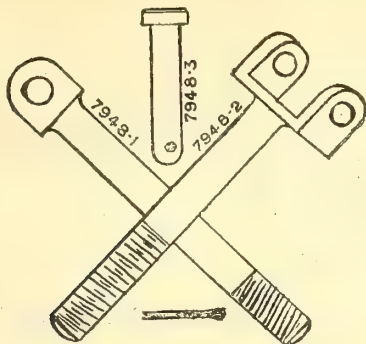
The Imperial Flying Service Pilots say it is the Best in the Country.

Write for Particulars and Illustrated Book issued Free.

**32, KING STREET, NOTTINGHAM.**

'Phone 5766.





ALSO

**A.G.S. PINS, 383/2-19-20.**

GOOD DELIVERIES.

**COVENTRY AVIATION COY., 34a, EARL ST., COVENTRY.**

Phone—92 Coventry.

Wires—Coviation, Coventry.

Y.E.S.  
Telegrams:  
Y.E.S., LEEDS.**Y.E.S. PHOSPHOR BRONZES**

(Cast by 'EATONIA' Process.)

**Y.E.S. 'AERO' BRONZE**

(Under A.I.D. Inspection.)

PERFECTLY ROUND SMOOTH BARS,  
for Automatic Machines, up to 3' 6" long.

THE MOST DURABLE YET PRODUCED.

SOLE PRODUCERS AND SELLERS:

**YORKSHIRE ENGINEERING SUPPLIES, LTD.,  
WORTLEY, LEEDS.**Y.E.S.  
Telegrams:  
Y.E.S., LEEDS.

Y.E.S.

Y.E.S.

**Berling Magneto**  
insures a hot, fat  
spark at any  
altitudeWorth more  
Does moreManufactured  
by the  
**Ericsson Mfg. Co.**  
**Buffalo N.Y. U.S.A.****"CROID"**

LIQUID GLUE

'Approved' by 'A.I.D.'

Sole Manufacturers:

The Improved Liquid

Glues Co., Ltd.,

Gt. Hermitage Street

London, E.

Contractors to H.M.

Government.

**Aeroplane Steel Sheets**

as supplied by us to

**The Royal Aircraft Factory  
and leading Aeroplane Makers**Guaranteed to comply with the R.A.F. No. 9A  
specification. Stocked in all gauges. (Sheets  
are passed and stamped by the "A.I.D.")**BERNARD NICKLIN & CO.**

IRON AND STEEL WAREHOUSE

SMETHWICK, BIRMINGHAM

Telegraphic Address:  
"Bernico," Birmingham.Telephone No.:  
224 Smethwick.**STAMPINGS****WASHERS****REPETITION WORK**

in all Metals

**BRIGHT DRAWN STEEL**

FOR

**AIRCRAFT and MOTOR WORK****J. B. GUTHRIE & SON**

(JOHN J. GUTHRIE)

**30, ST. MARY AXE, LONDON**TELEGRAMS—BUSIRIS LED, LONDON. E.C.3.  
TELEPHONE—AVENUE 1432.**The Air Navigation Co., Ltd.****BLERIOT & SPAD  
AIRCRAFT WORKS,  
ADDLESTONE (SURREY).****Contractors to War Office and  
Admiralty.****Flying Ground—Brooklands Aerodrome.****NORBERT CHEREAU, Managing Director.**

Telegrams—Bleriot, Weybridge.

Telephone—353 Weybridge.

**The Best  
Piston  
Rings**Scientifically designed. Made from  
high tensile cast iron and hammered  
to give an even radial distribution  
of pressure. Castight. Sizes up to  
30 in. diam.**The BRITISH CHUCK  
& PISTON RING CO. LTD.  
Holbrook Lane, COVENTRY.**

KINDLY MENTION "THE AEROPLANE"

WHEN CORRESPONDING WITH ADVERTISERS.



## TRADE CARDS.

**AEROPLANE TIMBER SPECIALISTS**

**JOSEPH OWEN & SONS, Ltd.,**  
**Borough Saw Mills, LONDON, S.E.**

Telephone: HOF 8811    Telegrams: "BUCHERON, SEDIST."

**P.D.V. Aircraft Company, Ltd.**

All Metal Parts for Aircraft made, comprising the following machine work: **Milling, Turning, Shaping, Press Work, Slotting, Drilling, Grinding and Sheet Metal Work.** Well-equipped Welding and Brazing Plant.

Enquiries to - **P.D.V. AIRCRAFT COMPANY, Ltd.,**

Offices & Works: **Princes Street, Richmond, Surrey.**

Telegrams: Asres, Richmond.

Telephone: 1081 Richmond.

**JAMES NORTH HARDY & SON, LTD.,**

54, PORTLAND STREET, MANCHESTER.

MANUFACTURERS of all descriptions of **COTTON and LINEN**  
**WEBS, TAPES & TWINES FOR AIRCRAFT**  
**AND ELECTRICAL WORK.**

London Branch: 3, FITCHETT'S COURT, NOBLE STREET, E.C.4.  
 Mills: HEATON PARK, nr. MANCHESTER.

Tel. Add.: "Hardson," Manchester    Phone: No. 6471 Central.

**Springs! Springs! Springs!**

We make a speciality of  
**Springs for Aeroplanes.**  
**SEND FOR PRICES.**

**Dart Spring Co., West Bromwich.**

**Chauvière's famous Integral Propellers**

HOLD ALL RECORDS; USED BY ALL  
 LEADING AVIATORS. THE BEST

Sole Proprietors for Great Britain and Colonies

**THE INTEGRAL PROPELLER CO., LTD.,**  
 Edgware Road, The Hyde, Hendon, N.W. 9.

Telephone—Kingsbury 104.    Telegrams—"Aviprop, Hyde, London."

**METRIC BOLTS & NUTS (5 m/m to 8 m/m).**

Stock Lists on Application.

**CASHMORE BROS.,**

TELEPHONE: **Zota**    **HILDRETH ST.,**  
**415 BATTERSEA**    **WORKS**    **BALHAM, S.W.**

Screw-Cutting and Light Engineering. Accessories for Aircraft.  
 Electrical and Motor Trades. Brass and Iron Foundries.

**ALWIN ENGINEERING CO., AERONAUTICAL ENGINEERS,**  
**LUTHER ROAD, TEDDINGTON, S.W.**

Tel. No. Kingston 2412.

Makers of all kinds of Aircraft Fittings. Presswork a Speciality  
 Pressings for DeHavilland, 5, 6, 9, etc. AVRO, SOPWITH, FAIRY and  
 many other types.

On receipt of Post Card our Representative  
 will call and give immediate quotation.

Trade **MENDINE** Mark.

**LIQUID SCOTCH GLUE**

USED BY THE LEADING AEROPLANE CONSTRUCTORS.  
**MOISTURE PROOF.**

Write for Price List and Particulars

**MENDINE CO., 8, Arthur Street, London Bridge, E.C.2.**

**EBORA PROPELLER COMPANY LTD**

*Ebora*

**PROPELLERS**

Contractors to the ADMIRALTY & WAR OFFICE

11 & 12 SURBITON PARK TERRACE, KINGSTON-ON-THAMES

Telephone: KINGSTON 672

Telegrams: "EBORA, KINGSTON"

**NAME PLATES.**

WE SPECIALISE IN EVERY DESCRIPTION OF  
 NAME PLATES IN METAL, IVORINE, ETC.

**CLEGG METAL ENGRAVING CO.,**  
**CHATSWORTH WORKS, WORTHING.**

**TIMMS ENGINEERING WORKS**

Makers of Jigs, Fixtures, and Special  
 Tools; also Aero Engine Components  
 and Gearing in quantities.

8a William St., West Kensington, W.14

**SCREW-DRIVING**

**RUSSELL BROTHERS, Ltd., REDDITCH**

**MACHINES.****FREDK. WARD**

— FOR —

**Aero Engine and Gun Gear Parts**

ALSO PATTERN AND JIGS.

**ALLSOP ST., UPPER BAKER ST., N.W.**

Phone: Paddington 4743.

**Printing**

Catalogues, Booklets, Leaflets, Showcards,  
 etc., designed, written, illustrated and  
 produced. Commonsense Ideas and Good  
 Style at moderate cost.

GODBOLDS, 8, BREMS BUILDINGS, E.C.4.

Phone: City 5912



# Auster

(1914) LTD

for **AUSTER-TRIPLEX SHIELDS**  
**AERONAUTICAL ACCESSORIES**

LONDON: 133, Long Acre, W.C.

Telephone: Regent 5910.  
Telegrams: "Winflexor, London."

BIRMINGHAM:  
Crown Works, Barford Street.

Telephone: Midland 2123.  
Telegrams: "Auster, Birmingham."

## HIDE GLUES

**FOR AIRSCREWS AND  
AIRCRAFT CONSTRUCTION.**

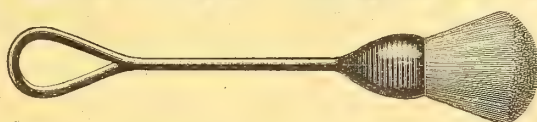
— APPROVED BY H.M. ADMIRALTY AND A.I.D. —

Manufacturers — **Wm. OLDROYD & SONS, Ltd., 9, Mincing Lane, London, E.C.3.**

Telephone: 4978 Avenue.

## 'FEARLESS' ENGINE CLEANING BRUSHES

As used by  
the R.F.C.



Send Trade Card  
for  
FREE SAMPLE.

**FEARLESS BRUSH CO., LTD., 4, NORTHWOLD RD. LONDON N.16.**

TELEGRAMS:  
EDIBRAC, 'PHONE  
LONDON."

## IMPERIAL LIGHT LTD.

TELEPHONE:  
3540 VICTORIA  
(3 LINES).

123, VICTORIA STREET, LONDON, S.W.1.

FOR

## FLUXES FOR WELDING

WE HAVE INVENTED

# THE

NON-EVAPORATING

# DOPE POT

ARTHUR HILL & Co.,  
SHEET METAL WORKS,  
SILCHESTER ROAD,  
LONDON, W.10.

Phone—1443 PARK.

## THE POOLE AVIATION CO.

POOLE, DORSET.

Contractors to H.M. Government.

Spares and all Parts of Machines.

**ENQUIRIES INVITED.**

Phone: Poole 54.

Grams: Aviation, Poole

## HEATING, DRYING AND VENTILATION.

### Kinnell's

OF DOPE SHOPS, AERODROMES AND  
AIRCRAFT FACTORIES, &c. OF EVERY  
DESCRIPTION. List 1134 free.

**C. P. KINNELL & CO., LTD.** Phone—  
Hop 372  
65, SOUTHWARK ST., LONDON, S.E.1.

## HOPTON & SONS

(HOPTONS)

GEORGE STREET,  
EUSTON SQUARE,  
LONDON, N.W.1

&

UNION WORKS,  
MARKET HARBOUR,  
LEICESTERSHIRE.

**PIONEER TIMBER MERCHANTS AND  
BENT TIMBER MANUFACTURERS OF**

## AEROPLANE PARTS

Telephones—  
Museum 496.  
Mkt. Harboro' 13.

ESTABLISHED  
**1840.**

Telegrams—  
Hoptons, Eusquare,  
London.  
Hoptons,  
Mkt. Harboro'.



## MISCELLANEOUS ADVERTISEMENTS.

**SPECIAL PREPAID RATE:** 18 words 1/6; Situations Wanted ONLY, 18 words 1/-; 1d. per word after. **TRADE ADVERTISEMENTS,** in these columns, 3 lines 3/-; 10d. per line after. Public Announcements, Legal Notices, Auctions, Contracts, etc., 16 per line. For the convenience of Advertisers, replies can be received at the offices of "THE AEROPLANE" 166, Piccadilly, London, W.1.

## PATENTS.

**PAGE & ROWLINSON,** Chartered Patent Agents (Consulting Engineer, Mr. S. E. Page, A.M.Inst.C.E.), 27, Chancery Lane, London, W.C. Tel. 332 Central.

**Henry Skerrett,** Chartered Patent Agent, 24, Temple Row, Birmingham.—Patents, trade marks, and designs.

## SITUATIONS VACANT.

**Wanted, Sheet Metal Workers,** fitters, and turner-fitters, must be first-class men. No one on Government work or residing more than ten miles away need apply to:—Harley Works, Beckton Road, Plaistow, E.16.

**Wanted at once in large progressive aircraft factory,** experienced and energetic erection shop foreman, used to tactful handling of men. No one on Government work need apply.—Applications must be made through nearest Employment Exchange, mentioning this paper and Box No. 3292.

**Stores Cost and Records Clerk.**—Wanted by firm of aircraft builders, Southern district. Must be thoroughly efficient and methodical. Used to aircraft, engineering, or hardware trades. Stores routine. Six o'clock man. Ineligible for military service. One who knows his job and would render good service is required. No one on Government work need apply.—Write, with full particulars of experience, and state salary required to nearest Employment Exchange, mentioning this paper and No. 3310.

**Aeroplane Cabinetmakers, Coachbuilders, Piano Case Makers, Carpenters and Joiners,** with experience of aeroplane work, or men desirous of obtaining aeroplane work, required in Tottenham district. No person already engaged on Government work or residing more than 10 miles away need apply.—Apply by letter to Box 101, W. H. Smith and Son, Kingsway, W.C.2.

**RADIATOR AND  
SHEET METAL  
WORK  
UNION WORKMEN  
(BEST RATES PAID)  
WANTED  
Apply—  
GALLAY RADIATOR CO., LTD.  
198, Gt. Portland Street, W.3.**

**Wanted Charge Hand** for fitting shop. Experienced on metal fittings for aircraft contract. No person already engaged on Government work or living more than 10 miles away need apply.—Box No. 3340, THE AEROPLANE, 166, Piccadilly, W.1.

**First-class Assistant Draughtsman** required for aeroplane work. Good mechanical experience essential. No one on Government work need apply.—State experience and salary required to nearest Employment Exchange, mentioning this paper and No. 3327.

**Chief Draughtsman** required immediately for large aircraft factory in Lancashire. Thorough experience of aircraft design essential. No person already engaged on Government work lars to your nearest Employment Exchange, will be engaged.—Apply, giving full particulars mentioning this paper and No. A.4477.

**Draughtsmen, Aeroplane, Jig, and Tool,** required for large aeroplane factory in the North. No person already engaged on Government work will be engaged.—Apply, giving full particulars to your nearest Employment Exchange, mentioning this paper and No. A.4478.

**Good Engineering Draughtsmen** wanted with some experience of aeronautical work preferred, but not essential. Those on Government work need not apply.—Write, stating experience and salary required, to nearest Employment Exchange, mentioning this paper and No. 3328.

## SITUATIONS WANTED.

**Works Manager,** or position of trust, 37, practical engineer, invaluable experience both aeroplanes and seaplanes. Tactful, energetic, methodical organiser, accustomed to latest service methods and capable of economically increasing production.—Box 3284, THE AEROPLANE, 166, Piccadilly, W.1.

**Progress, Production, Records, etc.,** responsible position required in aircraft factory. Will undertake to organise department upon sound modern lines.—Box No. 3309, THE AEROPLANE, 166, Piccadilly, W.1.

**Works Manager,** disengaged, requires similar position in aircraft factory. Good practical man and splendid organiser. Moderate salary and commission on production.—Write, Box 3319, THE AEROPLANE, 166, Piccadilly, W.1.

**Aero-engine Manufacturer (A.F.Ae.S.)** is open for engagement. Specialist in: (1) Mass production of accurate components, (2) gauge and tool manufacture, (3) machine tool design, (4) scientific heat treatment of high tensile steels, (5) lay-out of plant for aero engine manufacture. Capable controller of labour. Energetic and keen for production. Temporary or permanent engagement.—Box No. 3314, THE AEROPLANE, 166, Piccadilly, W.1.

**Buying Man** seeks responsible position; well up in all branches.—Box No. 3341, THE AEROPLANE, 166, Piccadilly, W.1.

**Works or General Manager,** practical engineer, 32; used to machine tool, prestool, and jig design. Presswork a speciality. Eight years' control labour, male and female. Energetic, good organiser. Must be Government work, with fair salary and bonus on output. Would be prepared to start factory or department on suitable terms bringing some connection.—Box No. 3329, THE AEROPLANE, 166, Piccadilly, W.1.

**Draughtsman** having good experience of aeronautical work is open to engagement.—Apply Box 3325, THE AEROPLANE, 166, Piccadilly, W.1.

**Engineer,** with flying experience, desires to superintend the fitting and running of engines or erection of machines for acceptance tests, or would accept similar responsible position.—Apply, Box No. 3326, THE AEROPLANE, 166, Piccadilly, W.1.

## MISCELLANEOUS.

**Nerve Failure** speedily cured, self-consciousness eliminated, concentration increased, and confidence restored by sympathetic hypnotic suggestion. Interesting explanatory booklet post free.—Robert McAllan, Regent House, Regent Street, W.1.

**Wanted,** copies of THE AEROPLANE for August 23rd and 30th, Sept. 6th, 13th, 20th, and 27th, 1916.—Write, stating price to the Publisher, Rolls House, Breams Buildings, E.C.

## WANTED.

**Wanted Woodwork** for aeroplanes, very large up-to-date factory, fully equipped with latest machines; any class of aircraft work undertaken; prompt deliveries; best work.—Apply Box 3030, THE AEROPLANE, 166, Piccadilly, W.1.

## AIRCRAFT PARTS.

**Hardwood for Aeroplanes.**—Specially Selected air-dried timber as supplied to leading constructors in Britain and the Continent. Silver Spruce, Ash, Poplar; Hickory and Ash Skids; Three-ply; Thin Cedar and Mahogany for Floats; Walnut for Propellers.—William Mallinson and Sons, Ltd., Hackney Road, 'Phone, 3845 Central, 4770 Wall.

**Tapes, Webs, Cords and Threads** in all qualities, suitable for Aircraft Work. Delivery from stock.—John MacLennan and Co., 30, Newgate Street, London, E.C.1. (See Advertisement Page iv of Cover and Buyers' Guide).

**Aeroplane Seats** to any drawing or specification. Prompt deliveries.—F. C. Chappell, Cane Works, 9, Fisher Street, Nottingham.

**Aeroplane Seats.** We can give quick delivery of cane seats, A.G.S. 264 or other patterns, guaranteed pass inspection. Write us for anything required in cane work.—The Willowbrook Company, Leicester.

**Wanted,** applications for manufacture of Government accepted patent for aircraft. Small repetition work. Large quantities required. Suitable for firms equipped for hard wood turning, pressings, stamping, die casting, metal spinning, and plain casting and turning.—F. W. Muir, Engineer, Thornbank, Statham, Lymm, Cheshire.

**Articulators** for kite balloon valves. Quick delivery, A.I.D. or Admiralty.—Rudling, 12, Regent's Buildings, Handel Street, King's Cross.

## FOR SALE.

**Aeroplane Radiators.**—The Gallay Radiator Company, Limited, stock Aeroplane Radiators. For the benefit of Constructors, can supply radiators for experimental purposes at a nominal cost. Advice given on suitable types for the various approved engines. Our drawing office is always at our clients' disposal.—198, Great Portland Street, London, W.1.

## ENGINEERING.

**British School of Aeronautics.**—Aircraft Engineering Course; Aero Design; Aero Construction; Aero Draughtsmanship; Mechanical Engineering.—Pennington's, 254, Oxford Road, Manchester.

## AVIATION

## AVIATION INSTRUCTION

on up-to-date lines, by a qualified Engineer in Aeronautics. Demonstrations from complete set of parts, and sectioned models.

Send for Prospectus No.1.A.,  
**THE MOTOR TRAINING INSTITUTE LTD.,**  
10, Heddon Street, Regent Street, W.1.

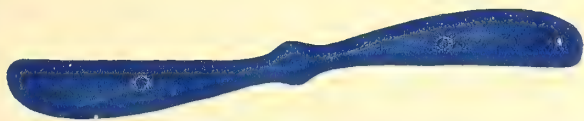
## MODELS.

**Model Aeroplane,** flies  $\frac{1}{4}$  mile circular flight, carriage paid, 3s. 4d. "I can thoroughly recommend your machines." Testimonial from Dr. Adams, Union Road, Sheffield. Thousands satisfied, testimonials from all parts.—Dept. C., Bristol Model Aeroplane Depot, Eastville, Bristol.

**Model Motors.**—First-class  $\frac{1}{2}$ -h.p. Motors, air or water-cooled, castings, with cylinder-bored valves bored, crank-cases spigotted, spark-plug tapped, valve box machined out; instructive; cheap, 9s. 9d. Catalogue—Gas, Oil, Petrol Motors—2d.—Ilttcover Motors, Derby.



## CHAUVIÈRE'S Integral Propellers



are used more extensively than  
any other Propeller in  
the World.

Hold all Records and are  
indisputably the best.

Maximum Efficiency.  
Best Workmanship.

**THE INTEGRAL PROPELLER CO., LTD.**

Edgware Road, The Hyde, Hendon, N.W.2.

Telegrams: "Aviprop, Hyde, London." Telephone Kingsbury 104.

## OXY-ACETYLENE WELDING & CUTTING

### PLANT

BLOW PIPES AND ALL WELDING ACCESSORIES  
CARBIDE. FLARELIGHTS. HANDLAMPS



PETROL AND OIL STORAGE TANKS OF ANY CAPACITY.  
STEEL BARRELS, SHEET METAL WORK FOR AIRCRAFT, &C.

**THE  
Acetylene Corporation Ltd.**  
**49 VICTORIA ST., WESTMINSTER.**

Telegrams:  
"Flamma, Vic, London."

Telephone:  
Victoria 4830.



Tel. REGENT  
3996

LONDON OFFICE: 1, ALBEMARLE STREET, W. 1

*All classes of machining.*

*FINE LIMIT WORK.*

**JIGS, GAUGES, AND SPECIAL TOOLS.**

**TURNBUCKLES, EYEBOLTS A.G.S. SPECIFICATION.  
STAMPINGS, AND HIGH-CLASS STEEL FORGINGS,  
PRESS WORK, &c.**

**OVERHAULING AND REPAIRS TO ALL TYPES OF  
AERO MOTORS.**

**PROPELLERS FOR ALL TYPES OF AIRCRAFT.**

*CRANKSHAFTS, PISTONS, GUDGEON PINS, VALVES A SPECIALITY.*



# THE GREEN ENGINE

## CO., LTD.



**:: CONTRACTORS TO ::  
H.M. ADMIRALTY  
AND WAR OFFICE.**

# 166, PICCADILLY, W.1.

Telegrams: "Airengine, London"

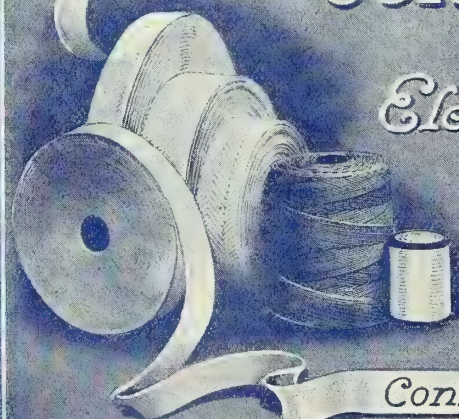
Telephones: Gerrard 8165; Richmond 1293.

Telephone: City 3115.
ESTABLISHED 1875
Telegrams: "Vanduaara Cent. London."

## TAPES, WEBS, CORDS & THREADS

*for Aircraft  
Electrical & Munition Work.*

*Delivery from Stock.*



### JOHN MACLENNAN & CO

30 NEWGATE ST LONDON E.C.1.  
AND AT GLASGOW.

*Contractors to H.M. Government.*

EDITORIAL AND ADVERTISEMENT OFFICES, 166, PICCADILLY, W.1.

Printed for THE AEROPLANE AND GENERAL PUBLISHING CO., LTD., by BONNER & CO., The Chancery Lane Press, Rolls Passage, London, E.C.; and Published by THE WM. DAWSON PUBLISHING COMPANY, LTD., at Rolls House, Breems Buildings, London. Branches in Canada, Toronto, Montreal, and Winnipeg; in South Africa: Cape Town, Johannesburg, and Durban.



# THE AEROPLANE

WEDNESDAY, FEB 13 1918.

Edited by  
G. G. G.

Vol. XIV, No. 7

THREEPENCE WEEKLY

[Registered at the G.P.O.  
as a Newspaper.]

## THE NORMAN THOMPSON FLIGHT CO. Ltd.

Telegrams—SOARING, BOGNOR  
ENTIFLYTE CHARLES, LONDON

ESTABLISHED 1909

Works—MIDDLETON, BOGNOR

CONTRACTORS TO THE ADMIRALTY

Telephones—BOGNOR 48. GERRARD 7385

London Office—  
DEWAR HOUSE, 11, HAYMARKET, S.W.1.

DESIGNERS AND MANUFACTURERS OF FLYING BOATS AND LAND PLANES

**Auster** FOR **Aero-shields**  
LONDON. BIRMINGHAM

**BEARDMORE** AERO  
ENGINES

**TITANINE**  
NON-POISONOUS  
**DOPE**  
SEE ADVERT. INSIDE.

**ACCLES & POLLOCK, LIMITED**

WELDLESS STEEL TUBES — OLDBURY, BIRMINGHAM.

**TRIPLEX** Safety **GLASS**  
See Advt. inside



# . THE . ENGINEERING TIMBER CO. Ltd.

11, Victoria Street, London, S.W.

J. E. HUSON, Managing Director.

Telephone: Victoria—5073, 4210

Telegrams: Entikosil, Vic. London.

**SILVER SPRUCE**

**ASH**

**WEST VIRGINIAN SPRUCE**

**WALNUT**

**MAHOGANY**

**GLASGOW:**

**67, HOPE STREET.**

Telephone: Central 3273.

Telegraphic Address: Entikosil, Glasgow.

**PARIS AGENCY:**

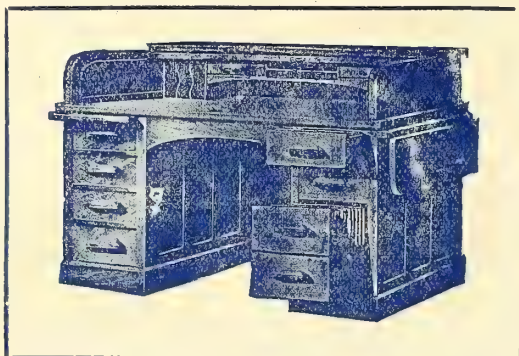
**6, RUE DE HAVRE, PARIS.**

## Factory & Office Furniture

LARGEST STOCK FOR IMMEDIATE DELIVERY.

(NEW AND SECOND-HAND)

SPECIALITÉ



SAFES.

**COOKE'S (FINSBURY) LTD.**

INCORPORATING

The FINSBURY OFFICE  
FURNISHING Coy.

&

J. W. COOKE  
& Coy.

**FINSBURY PAVEMENT HOUSE, LONDON, E.C.2.**

Telephones: LONDON WALL } 6179.  
573.

See Telephone Book relating to our Shopfitting Signs and other Departments.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# EMAILLITE

NON-POISONOUS

**AEROPLANE DOPE.**

THE ORIGINAL AND STILL THE PREMIER.

AS  
TIGHT



Trade Mark.

AS  
A DRUM.

**THE BRITISH EMAILLITE CO., LTD.,**

*Contractors to the Air Board.*

Registered Offices:

30, Regent Street, Piccadilly, S.W.1.

Wire—"Ridleytren, Piccy, London."

"Phone—280 Gerrard

Works

5, Hythe Road, Cumberland Park,

Willesden Junction, N.W.10.

Telephone—Willesden 2346 & 2347.

Metal  
Fittings  
a  
Speciality.

**The Aero Mechanical Co., Ltd.**

CONTRACTORS TO THE AIR BOARD.

60-66, ROCHESTER ROW, LONDON, S.W.1.

Telephone:  
Vic. 7570 (3 lines).

Managing Directors:  
E. Salomon J. Fogels n

Complete Fittings  
and Dies in Stock for  
latest D.H. Machines;  
also most of the Fittings  
for other D.H. Machines  
and Handley-Page.

**Our reputation has been built up by our ability to effect  
deliveries right up to time.**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# WARING & GILLOW LTD.

**CONTRACTORS  
TO THE  
WAR OFFICE AND ADMIRALTY.**

LIVERPOOL

HAMMERSMITH

LANCASTER



HEAD OFFICE  
**OXFORD STREET  
W.1**

TELEPHONE No.:  
**HAMMERSMITH 1980**

TELEGRAMS:  
"Warings Factories, Hammersmith."

**The  
WIGHT  
SEAPLANE**

**J. SAMUEL WHITE & CO., LTD.**  
EAST COWES, I.W.  
BUILDERS OF  
"WIGHT" Type Aircraft, Fast  
Torpedo Vessels, etc., etc., etc.  
Telephone: No. 3 Cowes.      Telegrams: White, East Cowes.



# Bowden Wire Ltd.



**LONDON**

BEING wholly engaged upon production for the British and Allied Governments, we regret that we are unable for the present to execute any orders for private purposes.

Victoria Road, Willesden Junction, N.W. 10.

Established 1897.

Godbolds

## Alardux

Alardux is the New Aluminium Flux

A Welding Flux of exceptional merit

May we send you a sample?

The Alardux Co.,  
23, Fleet Street,  
London, E.C.4.

City 866.

**AIRCRAFT DEPARTMENT**

THE WORLD'S LARGEST MANUFACTURERS OF ALL KINDS OF ENGRAVED METAL GOODS.

**British Metal (Kingston) Ltd.**  
*The Factory,*  
Kingston-on-Thames.

**DIALS & INSTRUCTION PLATES**  
MADE IN ANY METALS,  
IVORY, IVOROID, BONE, ETC.  
ANY QUANTITIES, WORDING, DESIGN,  
SIZE, SHAPE OR COLOURS.

COMPLETE SHEET METAL  
**AIRCRAFT COMPONENTS**  
RIVETED, SWEATED, BRAZED OR WELDED.  
R.E.8, F.E.2B.&D, B.E.2C-D-E,  
SE5, DE H6.  
RESIDENT A.I.D. EXAMINER.

CONTRACTORS TO H.M. GOVERNMENT

## W.T. CLARK & CO.

Telephone  
No.  
Central  
2121.

5, GREEN TERRACE,  
ROSEBERY AVENUE,  
LONDON, E.C.1.

Telegrams  
Etalspinne  
Isling London  
Two Words

**METAL SPINNERS**  
and  
**SHEET METAL WORKERS**  
for Aeroplane Constructors

**METAL SPINNINGS for AEROPLANES**

Cowlings (COMPLETE SET)  
Coverings  
Undershields

Fairings  
Petrol Tanks  
Shields etc.



BEATEN COWLS  
OF EVERY  
DESCRIPTION

SPUN COWLS  
UP TO  
48 INCHES  
IN DIAMETER.



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# THE BRITISH WRIGHT CO. LTD.

Owners of the British, Italian and Belgian Patents  
of Wilbur and Orville Wright.

Manufacturers of  
**AERONAUTICAL  
INSTRUMENTS**  
FOR  
NAVY & ARMY AEROPLANES

**Ogilvie Air Speed Indicators**

for use on Aeroplanes, Airships, Kites  
Balloons and Air Stations.

**Statescopes.**

**Recording Manometers.**

**Wind Speed Recorders.**

At present the Government is taking the entire output, but  
British and Foreign firms are invited to place their orders  
now for delivery of Aeronautical Instruments after the War.

**The BRITISH WRIGHT Co. Ltd.**  
33, CHANCERY LANE, LONDON, W.C.2.

# LEARN TO FLY

— AT —

## Bournemouth.

— THE —

**LARGEST AND MOST UP-TO-DATE  
CIVILIAN SCHOOL IN ENGLAND.**

*Immediate Vacancies.*

*Run under Rules approved by the Royal Aero Club.*

**RAPID TUITION.**

43 Caudron Service Biplanes (Solo & Dual Control).

**SPECIAL TRAINING**

for Pupils intending to enter the R.F.C. or R.N.A.S.

**APPLY :**

**Bournemouth Aviation Co., Ltd.,**  
AERODROME, BOURNEMOUTH. (Phone 1160).

# CHAUVIÈRE'S Integral Propellers



are used more extensively than  
any other Propeller in  
the World.

**Hold all Records and are  
indisputably the best.**

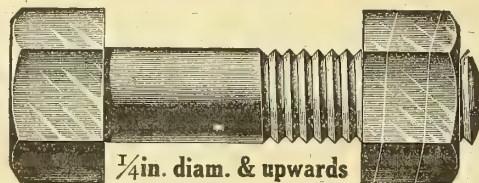
**Maximum Efficiency.  
Best Workmanship.**

**THE INTEGRAL PROPELLER CO., LTD.**

Edgware Road, The Hyde, Hendon, N.W.9.

Telegrams: "Aviprop, Hyde, London." Telephone Kingsbury 104.

# BRIGHT BOLTS & NUTS



1/4 in. diam. & upwards

(Suitable for Every Description of Engineering Work)

**QUALITY, ACCURACY AND FINISH GUARANTEED**

# THE "HELICOID" LOCK-NUT

(THE FINEST LOCK-NUT IN THE WORLD.)

This nut will remain secure, no matter how great  
the vibration may be—in fact vibration actually  
tightens the grip.

(made from 1/2 in.  
to 2 1/2 in.)



(sample nut & prices  
on application)

We also manufacture Wrought Iron Railing and Gates, etc.

**BAYLISS, JONES & BAYLISS,**  
WOLVERHAMPTON.  
LTD.

London Offices: 139/141, CANNON ST., E.C.4.



# "NOVELLON" DOPE AND AEROPLANE VARNISH. CELLULOSE ACETATE & CHEMICALS

**BRITISH CELLULOSE & CHEMICAL MANF'G.  
COMPANY, LIMITED.**

Telegrams:

Cellutate, London.

8, WATERLOO PLACE, S.W.1.

'Phone: Regent 4045.

Works: Spondon, Derby; and Maybury Gardens, High Road, Willesden Green, N.W.10.

(Telephone: Willesden 2380.)

## Urgent Requirements.

### MATERIAL WANTED.

Offers required for the following:—

PLYWOOD,  $\frac{1}{16}$ ",  $\frac{3}{32}$ ",  $\frac{1}{8}$ ",  $\frac{3}{16}$ ",  $\frac{7}{8}$ ",  $\frac{1}{4}$ ",  $\frac{1}{2}$ "

ALL TYPES OF METAL FITTINGS,

ALUMINIUM DIE CASTINGS,

and HOT BRASS STAMPINGS

for AVRO 504 J Biplanes.



**THE GRAHAME-WHITE AVIATION CO., LTD.**  
AERONAUTICAL ENGINEERS.

### NOTICE

To DeH.6. Contractors.

We can supply *ex* STOCK  
BLANKINGS for all Metal Parts  
and AXLES complete.

Special developments of the following:—

Parts Nos. 9485	} Three blankings per set.
" " 9488	

Telephone:—Kingsbury 120 (5 lines).

Telegrams:—Volplane, Hyde, London.

**THE LONDON AERODROME, HENDON, N.W.9**

Proprietors of the London Aerodrome and the Grahame-White School of Flying.

## THE AIRCRAFT CONSTRUCTION CO.

EVERY DESCRIPTION OF METAL COMPONENTS.

IMMEDIATE  
DELIVERY OF

**SE5 SUMPS, part 11612-1**

**HARLEY AEROPLANE WORKS, Beckton Rd., E.16**

Telegrams: "Aercracons," Canning, London.

'Phone: East 1300.



SUNFLOWER



TRADE MARK

FLUX

FOR

ALUMINIUM

(LET US SEND YOU A SAMPLE.)

Sole Manufacturers:

IMPERIAL LIGHT LTD.,

Telegram: 123 VICTORIA STREET, Telephone:  
 "Edibrac, LONDON, Victoria  
 Phone, 3540  
 London." S.W.1. (3 lines.)

Bowden,  
Tyseley.

BOWDEN  
CONTROLS  
and  
BOWDEN CABLES  
for all  
AEROPLANE  
PURPOSES.

Quotations on application.

Note Address—

The BOWDEN BRAKE  
Co., Ltd., Tyseley,  
B'HAM.

R. H. S.

Telegraphic Address: POETRY, 'PHONE LONDON.  
 Telephones: AVENUE 995, 996, 7996.

(Partners:  
 H. W. PRITT,  
 W. G. PRITT,  
 P. W. SMALLWOOD,  
 E. R. HILL),

PRITT &amp; CO.

METAL WAREHOUSEMEN, MUNITION  
AND AERONAUTICAL CONTRACTORS

46, FENCHURCH STREET,  
LONDON, E.C. 3,

Where all communications must be addressed.

CITY WAREHOUSES: 62a, Vine Street, Minories, E.  
 9, Jewry Street, Aldgate, E.C.  
 DEPOTS: Paddington, Poplar, Shoreditch.

We hold good stocks, complying with Air Board, P.A.F.  
and Admiralty Specifications, of the following:

BRASS & COPPER in sheets, tubes, rod, wire, etc.  
 TINNED STEEL SHEETS.  
 MILD STEEL SHEETS, 9a.  
 BRIGHT DRAWN MILD STEEL BARS, 3a.  
 A. G. S. BOLTS, NUTS AND WASHERS.  
 COPPER RIVETS. TINMAN'S SOLDER.  
 SOLDERING IRONS.  
 BEST SWEDISH WELDING WIRE.  
 BRAZING SOLDER in wire and granulated form.  
 SILVER SOLDER. WIRE GAUZE, &c.

All material passed A.I.D. before despatch.

DAILY DELIVERIES made by our own vans within a radius of  
15 miles of our Warehouses.

NOTE.—All orders for Aeronautical Work receive especially  
prompt attention.

WE ARE BUYERS OF SCRAP BRASS &amp; COPPER.

Contractors to H.M. Government.

SWIFT  
AVIATION CO.

Dolphin Engine Plates in Stock,  
Complete Sets.

*Speciality Sopwith Spares.*

KINGSTON

PHONE—  
762 KINGSTON

'GRAMS—  
"SWIFT, KINGSTON"

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



CONTRACTORS TO THE ADMIRALTY AND AIR BOARD.

# C. G. Spencer & Sons

LIMITED,

AERONAUTICAL ENGINEERS,

MAKERS OF

== KITE BALLOONS, ==

PARACHUTES, AIRSHIPS

and

Balloons of Every Type.

FABRIC, ROPES, KITE CORDS, VALVES, BASKETS,  
— and Aeronautical Apparatus of every description. —

THE PIONEER FIRM.

FIRST IN 1835.

FOREMOST TO-DAY.

*Works :*

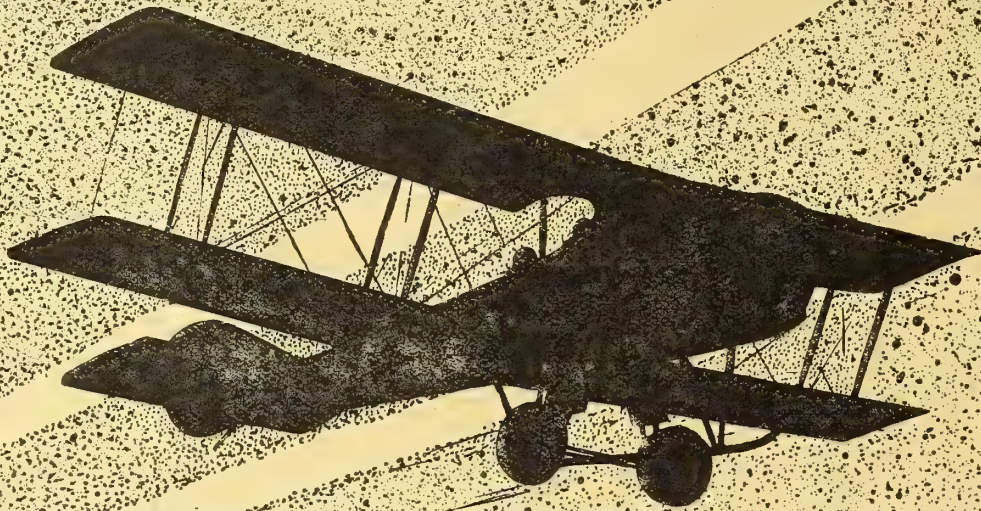
**Highbury, Clapton, Hackney & Brixton,  
LONDON.**

Head Office: 56a, Highbury Grove, London, N.5.

Telegrams: "AERONAUT, LONDON."

Telephone: DALSTON 1893.





# AVRO

## NOTHING BETTER

### A.V. ROE & CO. LTD.

TELEGRAMS  
TRIPLANE

MANCHESTER

TELEPHONE  
CITY 8530 &  
8531



# The AEROPLANE

The Editorial and Advertising Offices of "The Aeroplane" are at 166, Piccadilly, London W.1.  
 Telegraphic Address: "Aileron, London." Telephone: Mayfair, 5407.  
 Accounts, and all correspondence relating thereto, should be sent to the Registered Offices of  
 The Aeroplane and General Publishing Co., Ltd., Rolls House, Breams Buildings, E.C.4.  
 Subscription Rates, post free: Home, 3 months, 8s. 10d. 6 months, 7s. 7d.; 12 months, 15s. 2d.  
 Foreign, 3 months, 5s. 0d.; 6 months, 10s. 0d.; 12 months, 20s. 0d. Canada, 1 Year, \$4.70c.  
 U.S.A., 1 Year, \$5.20c.

## ON PROPAGANDA AND THINGS.

It is with considerable interest, if with strictly neutral sentiments, that one views the appointment of a Minister of Propaganda, in the person of Lord Beaverbrook, erstwhile Sir Max Aitken, M.P. for Ashton-under-Lyme, and formerly better known merely as Max Aitken, Canadian business man of the cutest.

Why a Minister of Propaganda should be necessary is not evident, for in any sane country of this size all the propagandist work necessary, both at home and abroad, could be done by an intelligent gentleman in the Civil Service, with a picked staff of half a dozen able assistants and a hundred clerks or so. We, naturally, get a false view of things because we seem invariably to start the wrong way to work.

Our home propaganda were left to the utterly futile fatuous poster campaign, from which, one gathers, sundry printers and publishers and advertisement agents gained much kudos with the Authorities. One hopes that the said people were not responsible for designing or choosing the posters and their sloppy sentiments, but were merely rewarded for doing their work as printers or managers as it should have been done, then at any rate their more intelligent acquaintances may retain their respect for them.

Then we put our foreign propaganda in the hands of a politician named Masterman, a fellow of whom Mr. Asquith had tried to make a Cabinet Minister, and who proved to be unfit to be such, even in an Asquith Cabinet. On the constituents of the said Masterman throwing him out of Parliament, when he sought re-election—that is to say, when a lot of provincial English showed that even they thought that he was not capable of presenting their local views capably before so futile an assembly as the House of Commons—our intelligent Government proceeded to appoint him to a well-paid job in which he had the task of presenting to the world the views of the British Empire.

Such complete imbecility on the part of a Government indicates that some change is necessary in the management of propagandist work, and as Lord Beaverbrook has the reputation in Canada of being as clever as they make them on the other side of the Atlantic, and as he has, furthermore, the reputation of getting what he wants, when he wants it enough, there is no doubt that he is capable of doing good work.

Possibly one proof of his ability as a propagandist is seen in the fact that Canada, which recruited less well than Australia, has carried conscription into law, whereas Australia has rejected conscription although her rate of voluntary recruiting gave one the impression that Australia was more loyal than Canada. Canada has, for a year or more, been fed carefully and cleverly with propagandist literature by the Canadian War Records people, under the control of Lord Beaverbrook, and that may have made all the difference.

Another point in his favour is that it is rumoured that he has a great desire to remove from the Cabinet one of the most fatuous, platitudinous, and incapable members of the Government with which we are afflicted. If he can succeed, he will deserve the nation's gratitude. Max Aitken used to be reckoned a fairly successful financier over the other side, so Lord Beaverbrook might not make a bad Chancellor of the Exchequer.

Be that as it may, Lord Beaverbrook has a great opportunity for doing good work in organising an intelligent campaign of propaganda, both as regards enlightening Allied and neutral countries on the splendid work Britain has done in the war despite her politicians, and as regards educating the people of this country to a true understanding of their position. The latter is, in fact, by far the more important task, for the people have hitherto been so befooled by their politicians and bamboozled by their newspapers that they have not the faintest idea of what is the real position to-day, nor of what the position has been in the past. Hardly any of the working classes realise even yet that there has always been a possibility of our being beaten by Germany, and still less do they realise what it would mean to them if we were beaten. One ventures to suggest, therefore, to Lord Beaverbrook that his first duty is to set before the people in plain language that they are "up against it"—to use an expressive colloquialism.

### THE NAKED TRUTH.

Here is the line of argument which one has found to appeal successfully to many people who have not seen the position in its true light before:—

#### IF WE ARE TO WIN:—

The British People must Work, Fight, and Starve.

If they do not work, the Army must run short of munitions, and so must be beaten.

If they do not fight, by letting the young and fit men go to the Army, the Army must run short of men, and so must be beaten.

If they do not starve by limiting their consumption of food to the decreed rations, then the food supply will not hold out till the Army has won the war, and we must be beaten.

#### IF WE ARE BEATEN:—

The German will occupy the country, for there will be nothing to stop him.

The German will not lay the country waste, but will preserve it and make it pay for the cost of the war.

The German will make the British workman work to pay that cost.

The German with a revolver and a whip in his hand is a worse task-master than any British employer.

The German will not over-feed or over-pay his slave labour, but he will make it produce as it never produced before.



THEREFORE :—

Either the British workman must work and fight now, and remain a free man hereafter; or, he can strike now and be a slave hereafter.

The choice is in his own hands. There is no alternative.

There will be no revolution in Germany. The German governing class is stronger than ever it was, for it has stayed at home and governed while the Socialists and the Middle Classes have done the fighting and have been killed off.

Revolutions, revolts, and strikes in the Allied countries are playing into the hands of the German Governing class by making their victory easier.

Germany is not attacking Russia to-day, because an invasion of Russia might unite the Russians in self-defence. Germany is waiting till civil war has made Russia incapable of defence and until the German army will be welcomed by all decent Russians as the only way of restoring law and order. Then Germany will occupy Russia, organise it, and force the lazy Russian workman to work and pay Germany and Russia for the war, plus a handsome profit to Germany.

Germany is trying to play the same game in Britain, France, and Italy. It rests with the British workman whether Germany succeeds or not.

#### PLAIN FACTS.

There you have a perfectly plain statement of fact, which even the most stupid and uneducated can understand. No workman is such a fool as to think that an undisciplined mob out of a workshop could stand up to a platoon of German troops with a couple of machine-guns. Any attempt at rebellion against a conquering army would merely result in massacre, as it did in Belgium and Servia.

If Lord Beaverbrook will only start and drum those facts into the head of the British workman, he will do great service to the Empire, for the workman does not yet understand them. At present the workman is so full of his own imaginary grievances—despite his high wages—that he cannot grasp the main issue of the war, namely that we must win if we are not to be conquered.

#### THE VOICE OF KNOWLEDGE.

The previous notes on this subject, under the heading "The Gadarene Swine," have brought a letter, which deserves very serious attention, from Mr. S. F. Edge, one of the most far-seeing men in this country, a pioneer of cycling and motoring, and now a scientific agriculturist who has proved by practice that this country can feed itself if properly worked. Mr. Edge writes :—

Gallops Homestead, Ditchling, Sussex,

February 1st, 1918.

Dear Sir,—Your leading article in this week's issue is one which sets out the present industrial unrest in the simplest and most straightforward way that I have ever seen it dealt with, and if it could be printed and circulated in millions throughout the country it might be the very tonic this country requires.

These traitorous agitators that you refer to seem quite unable to appreciate that if the German Government is able to maintain itself by orderly force, and that in other countries mob-rule can only maintain itself by brutal force, the best people of the Allied countries in Europe will automatically prefer orderly rule, even if German, to mob-rule in their present country.

These facts are patent to thinking people, and if only they could be brought home to everyone throughout the country it might make the present dissatisfied workpeople realise where resistance to orderly Government control in this country will land both themselves and our country.

It is curious to me to see that an aeroplane paper

appears to size up the whole situation more clearly and simply than I have ever seen it stated in any ordinary newspaper.—Yours truly,

(Signed) S. F. EDGE.

It is of interest to note that Mr. Edge offered his services early in the war to the Government, in the hopes of aiding the department concerned with food production. One may be wrong, but one is under the impression that after some experience of the futile methods of civilian departments, and of the atmosphere of politics therein, he left the department to take care of itself and devoted himself to doing his own job in his usual efficient way. Thus the Government has lost the service of one of the best organisers and clearest thinkers in the country.

Mr. Edge speaks for all intelligent people when he says that they will automatically prefer orderly rule, even if German, to mob-rule, in their present country. And, furthermore, one is only telling the truth in saying that, in the event of mob-rule getting the upper hand, any army, whether our own or an enemy army, which came in to suppress that mob-rule would receive the cordial support of all people possessed of any intelligence whatever. This, also, is a point which Lord Beaverbrook might make clear to the people.

#### THE TYPICAL UNEDUCATED VIEW.

As an offset to Mr. Edge's intelligence it is worth while to publish also a letter from a young workman, who appears to be typical of the class produced by our mis-called educational system. The lad has the pluck to give his name and address, which is therefore not published, and so shows his superiority over the usual writer of abusive letters, who is anonymous. With proper education and some experience of the world this youngster might well develop into a useful member of society. One hopes that in any case he will escape becoming a shop-steward or any other kind of professional agitator.

In order to facilitate reference in the reply and to avoid quoting his words a second time, the various sections of his letter have been lettered, though not so divided in the original. Here is what he has to say :—

February 2nd, 1918.

Sir,—I now take the opportunity of writing a few lines in defence of the British workman who I think have had to stand a great amount of criticism through the Press and other journals from the master men.

(A) When I first ordered your journal about 2½ years ago, your great cry was against the Government, for not giving more attention and orders to the private firms. Thus you were voicing the masters.

When eventually orders came along more aircraft workers were wanted, and from 50 hours per week we had to work all the hours God sends.

(B) I admit that the aircraft "game" was wrong from the start, as, the same in other branches of munition work, the officials should have conscripted labour, but now they have got to make the best of a bad job.

(C) Now, it is reckoned we are turning out aircraft twice as fast as the enemy and that some men could be spared.

Quite right, too, but, though the young first, some consideration should be made to early aircraft workers who had to work short hours and low rates. Owing to the drastic action of the Government in taking men out of unessential trades to the aircraft industry I suppose the young have got to go, but these latest recruits don't know, in some cases, what part of the machine they are making.

Some men don't know which is the leading edge from the trailing edge of a plane, and numerous other things which would sound equally ridiculous.

(D) Just lately, owing to discontent between the



men and masters, small strikes have taken place. You, no doubt paid by master men, have been "letting loose" at the aircraft worker.

You know how much the rate of wages have gone up in comparison to the price of food. Many homes are only kept going owing to the overtime worked, and the people who are "piling it" are the master men.

(E) Looking down the current share quotations in your issue of January 23rd:—

Rolls-Royce £1 ord. ....	63/-	64/-
Sunbeam £1 ord. ....	79/-	80/-
A. and W. £1 ord. ....	42/-	43/-

and numerous others which show that the aircraft firms are "piling it," and it is about time the working man had a fair living wage instead of working all the hours that God sends to exist.

(F) No doubt in your case you don't need to trouble much, considering that the journal used to be 1d. and then all of a sudden a jump to 3d. Paper and printing materials did not rise 200 per cent. in that short time, and I think you are well in pocket and doing a bit of "profiteering."

You claim to have been a British workman, but now you are one of those people that are paid by the masters to try and beat down the working man who is only fighting to merely exist.

(G) In your leading article this week referring to the disloyal workman, "yet he thinks that any workman can be a Cabinet Minister. Perhaps, judging from our samples, he is not to blame for thinking so."

You evidently don't think much of them yourself, and yet at the finish of the article you want "the workman to back their natural leaders loyally" who are no good.

(H) I will now disclose a few things concerning myself. I am 20 years of age, and previous to entering the aircraft industry three years ago I worked in

a cabinet-maker's shop and a joiner's shop. Of course I only got a "smattering" of the trade and general knowledge of using my tools.

I worked on B.E. 2B machines; planes, fuselage, and erecting; B.E. 2C, D and E planes, America Flyingboat, 24ft. ailerons and tailplanes, Maurice Farman planes, nacelles and erecting, Sopwith planes and erecting, Fairey "C—" fuselages, and "D—" planes. Not a bad assortment, I think.

Now, owing to the Man-Power Bill, I think I will have to join up. I put in for an application form for a cadet R.F.C. I had a secondary school training, and my application was refused owing to my vision being a shade defective; otherwise I was fit.

(I) I doubt whether 80 per cent. of the cadets had ever seen the interior of an aeroplane and general details, and yet in my case I am prevented from taking an active part in that which I have taken great interest

Most pilots and observers wear goggles when flying. I suggest that the goggles be fitted with lenses that are suitable for the eyes and then I think they would get a few more practical men who are prevented owing to their vision being a shade defective.

I had an application for the R.N.A.S. refused about a year ago owing to working on aircraft.

(J) I have had THE AEROPLANE for 2½ years and have found it instructive to a degree, but did not like the attacks on workmen.

No doubt you think I am too young to take much notice of, but I can assure you this is my first attempt (perhaps poor) to defend the working class and I mean well.

As I think you have a certain amount of influence I should like you to push forward that case of defective vision and goggles, as I should like to get in the R.F.C. as a pilot.



ON THE ITALIAN FRONT. Some Italian Flying Officers (on left) with R.F.C. Officers at an R.F.C. Aerodrome. The second figure from the right is wearing one of the new combination flying suits, designed to give complete protection against cold and at the same time freedom of movement in the narrow fuselage of the modern fighting machine. It should be compared with the cumbersome, if smarter, coat of the central figure.



## THE REPLY.

Now, taking the sections of his letter in order, (A) is witness to the foresight of those to whom one is indebted for the views which have guided this paper. After 2½ years the Air Council recognises that the designs of private firms, produced in competition with one another, are superior to official designs, and at last we are really getting ahead of the enemy. So far from voicing the masters, many of whom would have been content to build anything so long as they could get work, this paper has never voiced anything but the demands of the active-service pilots.

The demand for aeroplanes which extended the 50-hour week to about 60 or 70 (actual hours worked, not pay-sheet hours counting overtime at 1½ hours per hour) has made the aircraft worker a rich man, and might have made him richer if he had not been a fool and obstructed speeding up, reorganisation of factories, and the institution of piece-work.

## CONSCRIPTION.

(B) Here one agrees cordially with the writer. If the late Lord Kitchener had been stronger, or perhaps only a few years younger, he could have made himself Military Dictator in 1914. If he had announced the defeat at Mons as a blow against which we should need all our resources to recover, if he had then declared himself "Protector of the King and Realm," had dissolved Parliament, and had commandeered the newspapers and made them his mouthpieces, he would have had the whole nation with him, he could have had every man and woman enrolled under military control, and there would have been no more trouble about wages, rations, or anything else.

One gathers, however, that Lord Kitchener was opposed to conscription, and so he missed one of the greatest chances in all history. The German Emperor and General von Hindenburg took their similar opportunity, and one sees to-day the German Empire at least holding its own against the world in arms after three-and-a-half years of war.

This letter is evidence that if conscription had been applied promptly and fairly at the beginning of the war all our present troubles would have been avoided.

## OUTPUT AND DILUTION.

(C) Where the writer got hold of the idea that we are turning out aircraft twice as fast as the enemy is completely incomprehensible. We may be turning out greater numbers, owing to our employing vastly more hands on the job, but certainly our output per man and woman is nothing like so high.

For one thing our people are not so industrious as the German workpeople. Secondly, our factory organisation is hardly ever as good. Thirdly, the quality of finish, the close limits, and the mass of procedure on which the A.I.D. insists hampers output. Fourthly, our continual strikes, large and small, hamper output all round. And so one could go on almost *ad infinitum* with reasons why we do not turn out aeroplanes as fast as the enemy does.

As to the question of dilution of labour, as has been pointed out earlier in these notes, it is essential that the young men should go into the Army, unless the Army is to be beaten and the workpeople, young and old alike, are to be driven to work by German masters so that Germany may make a profit out of the war.

So long as a dilutee does his or her work as instructed, it does not matter whether he or she know for what that work is used or not. Skilled engineers are constantly employed in making pieces of secret mechanism for experimental torpedoes and such things, and their work is none the worse for their ignorance of its purpose. Naturally, if a man is interested in his job and knows it from A to Z, he will work more enthusiastically and

be a more valuable man, but if he is not working on the complete article and is only making components, it does not matter if he is ignorant of their purpose.

Considering that when war broke out there were certainly not more than a thousand aircraft workers in England, and none in Scotland, Ireland, or Wales, it is evident that all except about a quarter of one per cent. of the aircraft workers to-day are dilutees, so a man who has only been working on aircraft for two or three years has no right to jibe at one who has only been working for two or three weeks or months as a dilutee. If our young friend who wrote this letter goes into the Army now, he will know less about aircraft in three years' time than will a new man who started in an aircraft factory yesterday.

## MAN'S INJUSTICE TO MAN.

This question of dilution is one which needs to be tackled with a strong hand. Apparently the idea of this precious Amalgamated Society of Engineers, which seems to be the root of nearly all the industrial trouble, is that all dilutees of military age, regardless of their physical category, must join the Army before the youngest and fittest A.S.E. members are made to join up.

Now, one happens to know of an aircraft factory in which are three first-class tool-makers who were before the war respectively a carpenter, a stonemason, and a watchmaker. They work harder than the A.S.E. men, and they do better work. They are married men, over 30 years of age. Yet the local A.S.E. people demand that they shall be combed out into the Army before any perfectly fit A.S.E. youngsters of 20 or 21 years of age are allowed to go.

One of those dilutees is worth more to the output of aircraft than any dozen of the young A.S.E. men, who cannot at their age be experienced craftsmen. One fit A.S.E. man of 21 is worth more as a soldier than all three dilutees, and half a dozen more as well. And, because they belong to other unions the A.S.E. demand that they shall be sacrificed. Yet all those A.S.E. men are just as much dilutees in the Aircraft Industry as are the carpenter, the mason, and the watchmaker.

The thing which really stands in the way of the proper handling of labour is the fear in which our politicians stand of losing their jobs.

## RISING PRICES AND SINKING MONEY.

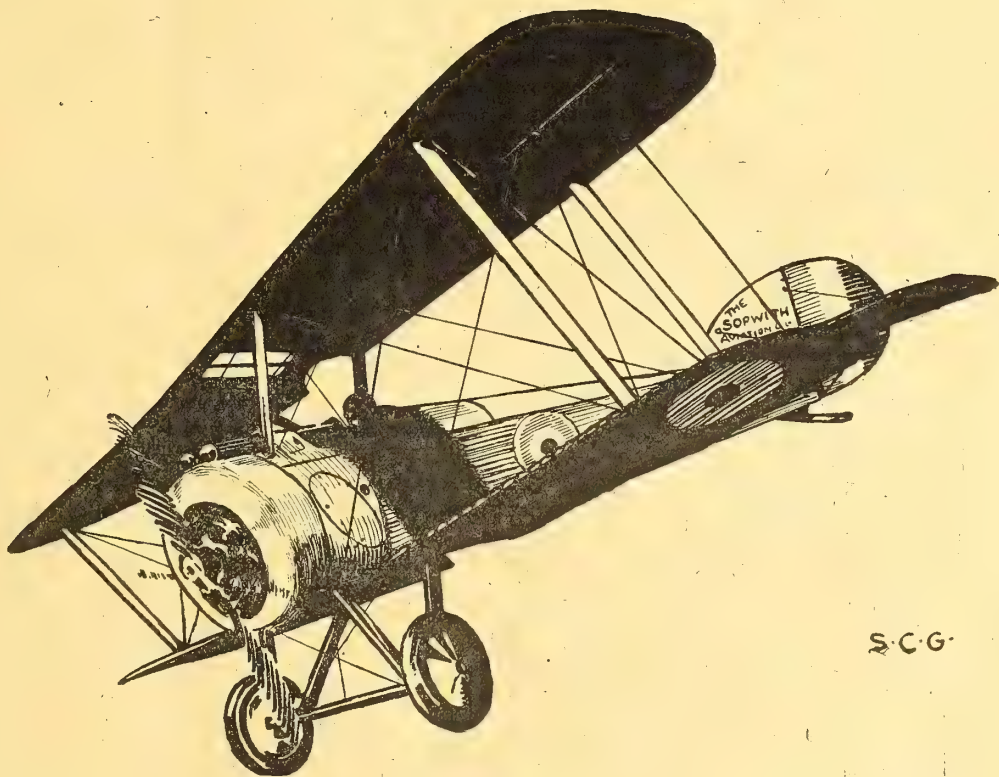
(D) The suggestion that this paper is paid by "master men," otherwise employers of labour, might well be passed over but for the opportunity which it affords of telling others who think as our young friend thinks a few facts. This paper is not paid by anybody. It competes for business in the open market against sundry competitors, and, because it is entirely independent of all influences and says what seems its duty to say, regardless of consequences, it is not so fat and well fed as it might be if it truckled to any one section of those concerned with flying. It has frequently lost advertisements through telling the truth, and one doubts whether many papers can say as much.

As to the comparative rise in wages and the price of food. There is really less connection between the two than one might think. The chief difficulty about food is that certain foods cannot be got, above a definite amount, at any price. The so-called rich people are in fact very much worse fed than the so-called poor.

It is true that the brain-worker does not need, and cannot eat, as much as the manual worker, and that brain-work is frequently better paid than hand work, so that the brain-worker, spending less on food, has more money in his pocket. But, as a matter of fact, most people eat far too much, especially in the working classes, where eating is quite as much an amusement as a means of sustenance.



# THE SOPWITH



**AVIATION COMPANY, LIMITED**  
**KINGSTON-ON-THAMES, ENGLAND.**  

---

**CONTRACTORS TO H.M. GOVERNMENT.**

---

Telephone: KINGSTON 1988 (8 lines).  
Telegrams: SOPWITH, KINGSTON.



Paris Office :  
21, RUE DU MONT THABOR.



The present meat and butter and sugar shortage has been very largely caused by over-eating on the part of the well-paid workman and his family. Any shopkeeper in any working-class district can verify that statement.

Such food as is procurable is not more than double its pre-war price, whereas thousands of men who never earned more than 30s. a week before the war are now drawing between £3 and £6 a week, and many of them up to £10 and £15. And this quite apart from the 30s. or £2 a week drawn by daughters and wives in the same families. Families which had to live on about £3 a week all told are in some cases bringing in between £10 and £20 a week. So that wages have gone up far more than food in most cases.

On the other hand, the master men, who are supposed to be "piling it," are spending their money on new and healthier factories, better machinery, better organisation, mess-rooms, hostels, recreation-rooms, canteens, and so forth, all of which improve the lot of the worker, and enable him to turn out more stuff with less trouble, if he cares to work, and so enable him to earn higher wages.

Few employers of labour are personally much better off than they were before the war. Their profits are taxed so that they are conscripted as to 80 per cent. of any excess above pre-war profits. They have to pay 5s. in the pound income tax on what is left to them. They are not allowed to raise their own salaries or to pay themselves a war bonus. In fact, the master-man himself is the one person who does not profit. Some of them are, in fact, worse off than before the war, because prices have risen all round and their takings have not.

The real profiteer is the merchant, who merely buys and sells, and the small shopkeeper who soaks the pennies out of the few really poor people still left in the country, and the workman who strikes for more and more money and fails to deliver the goods when he gets the money.

(E) The share list quoted is no guide at all to the study of profiteering. Most of the aircraft firms have absurdly small capitals in proportion to their turn-over, consequently a very small trading profit means a comparatively big profit on their capital. So naturally their shares are valuable. If the working man had any sense he would buy such shares, instead of spending money only on enjoying himself, and would thus provide for his old age and help to strengthen the financial stability of the nation.

It would be interesting to hear from our young friend what he considers to be a fair living wage for the working man. He must recollect that the man at the bench who works eight or ten hours a day—leaving out meal-times—who forgets all about his work as soon as he leaves his bench, and whose weekly output is worth perhaps 100 per cent. more than his actual wages—out of which 100 per cent. all the overhead charges of the factory have to come—cannot expect the same pay as a great business organiser whose whole time from waking at seven a.m. to going to bed at midnight is actual working time spent in thinking out business problems and putting them into effect. If there were no such highly-paid men there would be no work for the working man.

#### THE PAPER QUESTION.

(F) Here, again, a personal explanation may be excusable. Like everybody else outside the newspaper trade, our young friend forgets that the retail price of a paper is not the price which the proprietor gets for it. By the time all wholesalers' profits, discounts, etc., have been knocked off, he gets about half. That is to say, he gets about 1½d. for a 3d. paper, and ½d. for a 1d. paper.

When this paper sold for 1d. it contained anywhere between 24 and 40 pages, and the paper cost from ⅓ of a penny to one penny per lb. weight. To-day it contains between 84 and 96 pages, and the paper costs from 4d. to 7d. per lb. weight. So the weight of paper per copy is between twice and three times as great in the average number, and the price is from four to seven times as high, so that the reader gets anywhere between eight and twenty-one times as much for his money, while the proprietors get three times what they used to get.

As a matter of fact, every copy sold is a dead loss, and something like five times as many copies are sold as before the war. If one could only get hold of the paper one would willingly sell five times as many copies as are sold to-day, simply to spread the gospel of aviation. The demand from the Services and the Aircraft Industry is such that there would be no difficulty in selling 100,000 copies a week if the paper could be got.

Whatever profit is made out of a paper of this class is made out of the advertisements. As this paper existed for three years before the war without making any profit, and sometimes without even being able to pay the wages of the staff, it has no pre-war standard of profit. Consequently whatever profit it now makes is classed as war profit, and nearly all of it is conscripted by the Government for that reason. As a result the shareholders have never yet received a dividend. So that's that, as far as profiteering goes. If there were any profits, and if paper were available, one would gladly spend all those profits in sending up the circulation for the benefit of aviation in general.

#### THE NATURAL LEADERS.

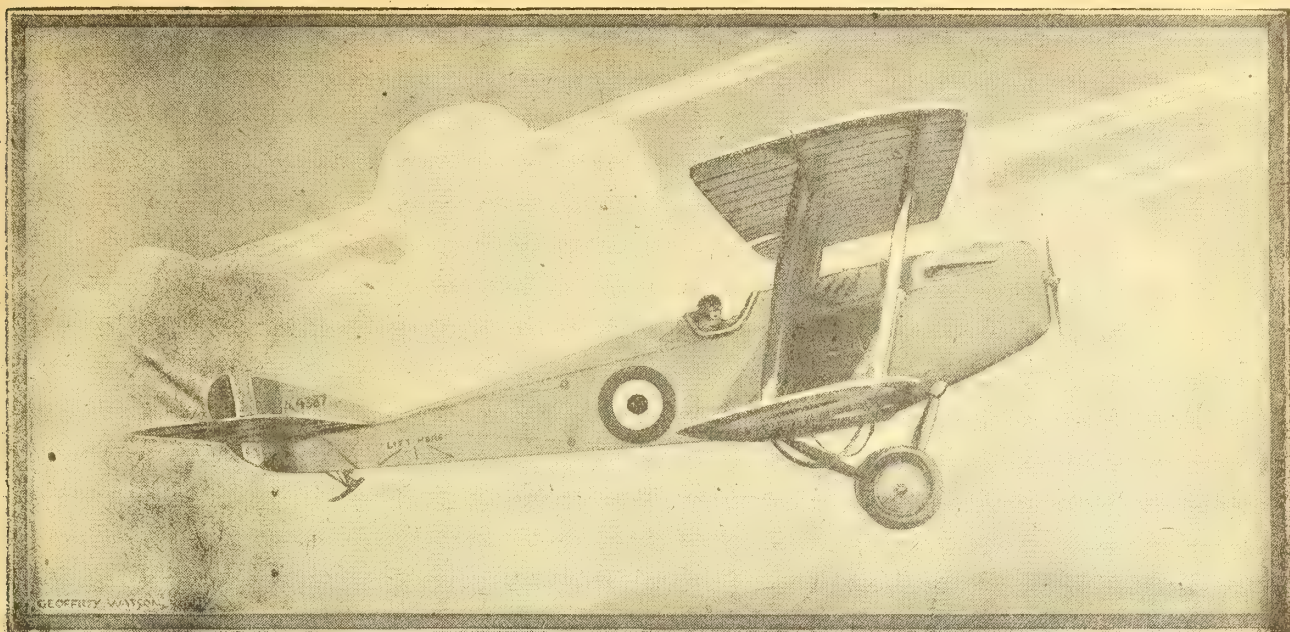
(G) Here our young friend falls into a curious error. How he can imagine that the present Cabinet can be regarded as the natural leaders of the people passes one's comprehension. Never were any gang of men less like natural leaders. The only natural leaders are the people who made the nation what it was, and who have made the British Army what it is. These are the old fighting aristocracy, and the born leaders of men who have risen from the classes below them, such as our great engineers, and soldiers of the type of the present Chief of the Imperial General Staff, Sir William Robertson, and the Commander-in-Chief in France, Sir Douglas Haig—the very people whom our lawyer-politicians have been plotting to displace.

Anyone reading the debates in the House of Lords and those in the House of Commons cannot fail to be struck by the obviously superior mental calibre of the Peers—despite their dilution with lawyers and merchants from the Lower House. The Peers, together with the Army chiefs, are the only natural leaders of the people in such a time of peril as the present. If the people back them, the nation will win through to victory. If it allows itself to be fooled about by lawyer-politicians and shopkeepers, it will come to ruin, and even German government will be welcome as an alternative to government by lawyers, Socialists, and the A.S.E.

#### EXPERIENCE.

(H) Apparently on the strength of three years' aircraft work, begun at the age of 17, the writer of the letter regards himself as a skilled workman. Certainly he has had useful experience which might be turned to better account in the R.F.C. than in a Labour Battalion, if his eyesight unfits him for a front-line trench. But on his own showing he is only a wood-worker, or what in the old days we used to call a "wood-butcher." It would take him another five or six years at least to be a skilled craftsman even as a wood-worker, let alone as an all-round aircraft worker, capable of doing metal-



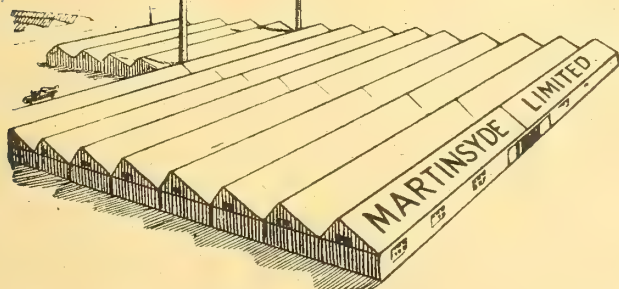


# MARTINSYDE

Aerodrome and  
Auxiliary Works:  
BROOKLANDS.

Head Office  
& Works:

WOKING, Surrey.





work, turning, erecting, rigging, and so forth. So he is scarcely indispensable or even highly necessary in the Aircraft Industry.

If he is fit for the infantry, that is obviously his place, for practically every other youth of his age has had as much experience of some sort of munition work, and has equal right to be called a skilled worker. The ranks of the infantry must be filled, and as all young men are now on munition work, obviously they must leave the munition works for the infantry.

(I) There is no need for R.F.C. cadets to have any knowledge of the interior of an aeroplane. All they have to do is to learn their military job and learn to fly. The inside of the machine is in charge of an equipment officer, also specially trained for the job, and in the majority of cases physically unfit for infantry work.

Certainly where a candidate is otherwise particularly suited to be a pilot but is barred by slightly defective eyesight, more latitude might be allowed in the matter of wearing special goggles. Still, even such latitude would scarcely seem to meet this case, unless and until the Air Force adopts the principle of using non-commissioned pilots.

## The Tank Question Again.

Certain recent notes in this paper on the Inside History of the Tanks seem to have raised renewed interest in the subject, and one hopes that they have brought a step nearer the day when the origin of this weapon, which might have ended the war a year or more ago if it had been properly constructed and handled, will be thrashed out publicly.

So far all that the Army at large knows about the question has been gathered from controversies in the press. Certain official pronouncements have been published allotting credit in various directions, but, so far as one can judge, these pronouncements have been based rather on the personal statements of people who claimed the credit than on evidence such as would be required in a court of law from disinterested parties who knew what was going on when the idea was first introduced.

However, as the subject is of so much interest to those concerned with aviation, both because several early aviators were mixed up with the tank scheme, and because in the next war—or perhaps in the later years of this war—tanks and aeroplanes will have to co-operate so closely, it seems worth while to publish two letters received during the past week. The first is from Col. Crompton, R.E., an engineer whose name is well known, if not his achievements; the other is from Maj. Kerr-Smiley, M.P., whose precise concern with tanks is not apparent.

### COL. CROMPTON'S VIEW.

Col. Crompton's letter reads as follows:—

Crompton Laboratory, Thriplands,  
Kensington Court, London, W.8  
February 1st, 1918.

### SOME INSIDE HISTORY OF THE TANKS.

Dear Sir,—On page 466 of your issue of THE AEROPLANE of January 30th, 1918, under the above heading in large type, a series of statements are made the correctness of which the writer who signs the initials "C. G. G." states that he can prove.

I do not know what proof this gentleman can bring forward whether it is by the personal assertions of Mr. Macfie or by correspondence, drawings or documents, but as I was appointed Consulting Engineer to the Admiralty Committee which originated the Tanks some time before Mr. Macfie's ideas were first brought before it, I am in a position to absolutely contradict some of the statements in your article.

One of these is that the idea of using an armoured caterpillar was started by the Armoured Car Division after Mr. Macfie came to them, whereas months previous to that date I had been instructed to perfect and adapt Mr. Diplock's pedrail as a caterpillar means of support to the Admiralty Tanks that were first designed.

The first working drawings for Tanks were prepared in this Drawing Office utilising at first Mr. Diplock's pedrail design and afterwards other forms of caterpillar tracks that had been for some time used in the United States for ploughing tractors. Of these American tracks two forms were purchased by order of the Committee, so that I was able to experiment with them to ascertain their supporting power on soft ground, the tractive effort that we could obtain, and the other data which it was necessary to obtain before anyone could design a Tank in a practical manner so that it could be constructed in an engineering workshop.

(J) One quite appreciates the writer's effort to defend the working class, and one is rather sorry that he mixes his defence so much with his personal dislike of going into the Army. It rather "gives the show away"—if one may be permitted a vulgarism.

Judging from his letter one fears that he has been listening too much to shop-stewards, walking delegates, labour agitators, and other traitors and cranks, and has absorbed some of their teachings in spite of his better nature. His point of view is exactly that of some hundreds of thousands of others of his class and age, which is why I have dealt with it at such length. Half of it is a genuine belief that the working man is badly used, for which belief we have to thank Mr. Lloyd George and his Limehouse type of speech more than anything else. The other half is pure selfishness coupled to a dislike of going into the Army, for which we have to thank our rotten system of education and the absence of the habit of conscription. Lack of discipline, as a nation, is one of our worst troubles to-day.

All of which helps to show the very pressing need for a sound propagandist campaign in this country, and emphasises the greatness of the opportunity now before Lord Beaverbrook.—C. G. G.

I only met Mr. Macfie once, that is, when he appeared before our Committee and gave us a lecture on the wonderful work that the caterpillar form of tractor had done for ploughing in the United States. He gave me the impression that he was a man full of ideas but with no detailed knowledge of what is required to utilise caterpillar supports for heavy armoured vehicles. But I never had any knowledge of any design prepared by him; if such a design had been offered to the Committee I must have known of it.

The real turning point which caused the Ministry of Munitions seriously to take up the employment of these vehicles was the very successful demonstration which was made with the Killen-Strait Tractor loaded so as to carry the weight of armour necessary to protect it. It was driven very adroitly and successfully by Major Hetherington in the presence of Mr. Lloyd George, Mr. Winston Churchill and other members of the Government, and the order to carry on with the complete design was then given.

(Signed) R. E. CROMPTON.

### SOME NOTES ON THE CROMPTON THEORIES.

As to the proof of the statement which I said that I could prove, the answer is that Mr. Macfie explained the tank idea, and the proper tactical method of operating it, to me in my office while he was still a civilian. That is law-court evidence to which I am prepared to swear. It fixes the date, because the date of Mr. Macfie's commission in the Armoured Car Division is in official records.

Mr. Macfie joined the Armoured Cars with the idea of pushing these same ideas along, which shows that he did not absorb the ideas from the Armoured Car people.

As to Colonel Crompton's part in the affair, perhaps he will correct me if I am wrong in saying that one of the ideas on which he was working—at the period which permits him to make a show of claiming priority to the Macfie tank—was an armoured machine which would convey numbers of men up to the enemy's front line trench, and there decant them through doors to attack as best they could. Such a machine could, no doubt, crush its way through barbed wire, but, as the men descended, they would be merely machine-gun targets. Also the machine could not cross trenches.

Doubtless, the design of the machine was an engineering job, within its limitations, and so was worthy of Colonel Crompton's name. As an example of ignorance of military tactics, the scheme seems to have been worthy of the most scholarly Sapper who ever passed through "The Shop."

As to Mr. Diplock's "pedrail" idea, I believe there were two forms. One was a series of pads, like elephants' feet, stuck round the periphery of the driving-wheels of an ordinary traction engine. The other was a series of similar pads stuck onto a chain. The former was obviously useless for cross-country work. The latter, I believe, was not designed as a driving mechanism, but purely as a trailer, to enable draught animals to pull loads out of or over soft ground. As a driving mechanism it appears to have been quite unsuitable.

Unfortunately, Colonel Crompton does not specify which form he used in his alleged ante-dating of Mr. Macfie's design. Likewise, unfortunately, Colonel Crompton does not give any dates concerning the two American caterpillars of which he writes.



# WESTLAND *Aircraft.*

WESTLAND AIRCRAFT WORKS.

BRANCH OF PETTERS LTD.

YEOVIL.

*Phone, Yeovil 141. Telegram Aircraft Yeovil.*





The only fixable date which he gives is that of the demonstration of the Killen-Straight tractor by Major Hetherington, which he describes as the "real turning point." One gathers from this that his Diplock experiments proved failures. When one recalls Colonel Crompton's curious beliefs and theories concerning cycle cranks and gearing, with which the cycle papers were filled some 15 years or so ago, one is not at all surprised.

In connection with the date of these Killen-Straight experiments, I believe I am correct in stating that Mr. Macfie's schemes were known for some considerable time before that date to the Armoured Car people, and that before Major Hetherington gave this adroit demonstration, Mr. Macfie's model caterpillar tank was already in the hands of his senior officers.

Furthermore, Colonel Crompton appears inclined to confuse the issues, firstly, by not distinguishing between the original and unpractical "land-ships" of his own and other designs, and the contemporary, if not antedatory, armoured caterpillar designs of Mr. Macfie, and, secondly, by avoiding altogether any reference to the tactical scheme associated with the "land-ships," and Mr. Macfie's tactical scheme. As a matter of fact, the tactical scheme for the use of armoured caterpillars was, and is, an integral part of the invention, though possibly an engineer may not appreciate the fact that the purely military use of a mechanical apparatus can be an integral part of its invention.

#### MAJOR KERR-SMILEY'S LETTER.

Major Kerr-Smiley's letter says:—

House of Commons Library, Feb. 2nd, 1918.

Dear Sir,—With reference to your article under the heading of "Some Inside History of the Tanks" in your issue of Jan. 30th.

It has been my privilege to have been shown various documents tracing the origination and early evolution of the Tanks or Landships, and in view of the information gained I think it is only fair to make the following comments:—

(1)—You state that Colonel Crompton and Major Hetherington were at work on the Landship idea at the time that Mr. Macfie joined the Armoured Car Force, but that the caterpillar mechanism had not been included in their design. This is not true, and there is an abundance of evidence to prove this. Colonel Crompton and Mr. Diplock were engaged in re-designing the Diplock Pedrail or Caterpillar to suit the conditions demanded before Mr. Macfie joined the Armoured Car Force.

(2)—You state that Mr. Macfie produced drawings of an armoured caterpillar and submitted them to Major Hetherington. This is equally untrue.

This question has already been ventilated in the "World" of Oct. 31st, 1916, and subsequent dates as follows:—

(a)—Mr. Macfie stated that he could prove that he had submitted designs to Major Hetherington—(vide the "World," Nov. 28th, 1916).

(b)—A letter was published in a subsequent issue signed by Major Hetherington refuting this statement.

(c)—Mr. Macfie from having this statement challenged, contented himself with saying that he had repeatedly urged the scheme to Major Hetherington—(vide the "World," Dec. 19th, 1916).

This alone should tend to show the value of these statements.

I am informed that all the officers primarily concerned are equally convinced that Mr. Macfie submitted nothing but an elementary treatise on *caterpillar tractors*, and which did not contain any novel ideas or information.

Regarding the caterpillar that was commenced by Mr. Macfie. This was entirely an independent experiment and had nothing whatsoever to do with the Committee, and the experiment was entirely under the direction of Commander Boothby, and was only commenced several months after the Committee had been at work on caterpillars.

I understand that Mr. Macfie stated during the later part of 1916 that his design had been copied by a certain motor-car firm in London and that a model had been submitted to the Admiralty as their own. I further understand that Major Hetherington was called to the Admiralty to see the model in question, which contained no features which could in any way be compared to the present Tank.

Mr. Macfie was asked to attend one meeting of the Landship Committee by Major Hetherington in view of the paper that he had submitted on the Holt and other caterpillar tractors, but the information he was able to give to the Committee on the subject did not warrant his being invited to attend any further meetings.

In view of the fact that officers on the active list cannot defend statements of this kind owing to the King's Regulations, I consider it only fair to point out that there are always two sides to every case, and that statements of this kind should not be accepted without a full investigation.

Yours faithfully, (Signed) KERR-SMILEY (Major).

As regards No. 1. I have already disposed of the matter of the Diplock pedrail.

As regards No. 2. Apparently this point turns on what constitutes designs and drawings within the meaning of Major

Kerr-Smiley's letter, and within the meaning of Major Hetherington's (assumed) communications with Major Kerr-Smiley. A purist of the drawing-office might argue that nothing short of a complete set of working drawings, giving all constructional details and dimensions, constitutes "drawings."

On the other hand, for the purposes of a junior officer wishing to introduce new ideas to a non-technical senior, such drawings would be worse than useless, in that they would merely bore the senior officer, who could not understand them, and make him hostile to the introducer by demonstrating the junior's superior mental equipment. Therefore one would be justified, under such circumstances, in classing either free-hand sketches or what we in the drawing office would call "general arrangement drawings," as being drawings within the meaning of my previous notes.

I have not the correspondence in "The World" before me, but my recollection of it is that Major Kerr-Smiley has omitted from his present letter some rather important points in the arguments quoted from that paper. The general opinion at the time was that Mr. Macfie's last letter, assuming, as one has reason to assume, the truth of his statements, distinctly established his claims, and left his opponents without much of the occupied territory.

#### NOVEL IDEAS.

I do not doubt for a moment that all the officers primarily concerned are, as Major Kerr-Smiley says, convinced that Mr. Macfie did not convey to them any novel ideas or information. In fact, I am convinced of the truth of his statement because the novel ideas and information which Mr. Macfie conveyed to me in 1914 were not put into effect till the Battle of the Somme in July, 1916, and then very imperfectly, by about the third or fourth group of officials who had succeeded those primarily concerned with the tanks. One is therefore forced to the conclusion that the said officers primarily concerned were incapable of assimilating these novel ideas, and that consequently, despite Mr. Macfie's best efforts, the ideas never succeeded in convincing to their understanding.

An existing letter, written long before tanks became working vehicles, from an active-service officer of high rank, now holding a very important office, shows that officers in the actual fighting line were quick enough to grasp these novel ideas of Mr. Macfie. One only regrets that those in charge of the tank job at home did not make for themselves an opportunity of seeing from the front line what would be required of these vehicles when they reached the front.

Doubtless also Major Kerr-Smiley is correct in stating that the "Landships" people were at work on caterpillars before Mr. Macfie's experiment under Commander Boothby began. That does not controvert the statement that his was the original of the present tanks, for we have Colonel Crompton's tacit admission—in his letter herewith—that his early caterpillars of the Diplock type were a wash-out, and that the turning point was the Killen-Straight, which one believes to have been demonstrated after Mr. Macfie's model was in hand.

As to Major Hetherington's statement, *via* Major Kerr-Smiley, that Mr. Macfie's model contained "no features which could in any way be compared to the present tank," no doubt Major Hetherington can be forgiven for not seeing the likeness, for though an excellent horseman, and an expert motorist, he can hardly claim to be an engineer, or a front-line soldier, and therefore he might well miss recognising the similarity between Mr. Macfie's ancient caterpillar design and tactical scheme, and those of the modern tank.

Incidentally, one regrets having to call it the "modern" tank, as the published photographs of those recently in use indicate that they ought to have been washed out somewhere about the period of the Battle of the Somme, instead of being then put in action for the first time. The poor things remind one only too painfully of the B.E.2c aeroplane which lingered too long on the battle-scene and departed only recently unwept, unhonoured, and unsung.

Finally, as regards the meeting of the Landship Committee, to which both Colonel Crompton and Major Kerr-Smiley refer. People have been omitted from further meetings of official committees for knowing too much, quite as frequently as for knowing too little. The striking feature about all these early Landship Committees is that hardly any of the members were engineers with workshop experience or knowledge of rough-and-tumble mechanical service such as the work of the tanks entails. None of the members had working experience of caterpillar mechanism. Mr. Macfie possessed all three forms of experience, which seems quite an adequate reason for freeing him out.

It is certainly unfortunate that officers on the active list are prevented by King's Regulations from taking part in controversies in which they are interested, but in some instances it may be as well that they are thus prevented from involving themselves in statements which might be hard to verify under the rules of evidence. It is, however, far more unfortunate that the originator of the tanks, Mr. Macfie, has never been given an opportunity of presenting his evidence before a competent and unprejudiced tribunal.—C. G. G.



THE BRITISH & COLONIAL  
AEROPLANE CO., LIMITED

—FILTON, BRISTOL—

CONSTRUCTORS OF

*The "Bristol" Aeroplanes.*

— CONTRACTORS TO —  
H.M. AIR FORCES.

Telegrams:  
"AVIATION, BRISTOL."



Telephones:  
3906 BRISTOL  
(Private Branch Exchange)



## Deductions from the World War: A Review.—(Continued.)

BY HENRY FORESTER.

### RAILWAYS.

In the book under review Von Moltke is given due credit for his trust in railways. The world was astounded at the rapidity with which the German troops were mobilised in 1870, and the ease and celerity of the move of 500,000 troops to Northern France. And yet in those days railways were in their infancy.

As to the present he says that "In the separate theatres of war movements of transports have been constantly effected, and at the same time the railways have been utilised for manœuvring purposes. The one-time notion which attributed a certain rigidity to railways as compared with progress on foot, because the latter could be deflected at a moment's notice in any desired direction, has now lost much of its force. In spite of the rigidity of the railway tracks, we have always contrived to dispatch the transports in accordance with the requirements of the military command" (p. 49).

Later he says "... the unhampered development of operations in the war of movement and a secure maintenance of positions in entrenched warfare are only possible if the bringing up of munitions, stores, and men and the removal of the wounded, as well as the systematic organisation of the sanitary service, are ensured by means of the railways. Only from time to time has it been possible to dispense with them by having recourse to motor wagons; but the latter have never really furnished an adequate substitute for railways" (p. 50).

The italics are mine. They express a view which is now generally held by the higher command, if the indications are correctly read.

### ELECTRICITY.

The electric telegraph is another development in war which makes closer the resemblance between military operations and a well-played game of chess. Each commander for the first time in history knows with exactitude the positions of the major units of his army within a short time of the completion of any movement. He is enabled to give orders to his subordinate commanders without the necessity of maintaining uninterrupted communication by road.

Had Napoleon, for instance, possessed a wireless installation he could have communicated with Grouchy and have accelerated that tardy warrior's movements by well-chosen words of command. Wellington, with or without wireless, could make no better disposition of his forces than in fact he did. Hence Napoleon with better communications would have turned defeat into victory and the history of Europe would have been entirely changed. There is fascination in the thoughts of all that might have happened had Mr. Marconi chosen an earlier generation in which to be born.

### AIRCRAFT.

Baron von Freytag devotes but little space to that great subject which gives this paper a right to existence and which has done much to popularise war amongst the masses.

He admits that the Zeppelin has no longer a part in land warfare. He would appear to think that the Zeppelin is a highly expensive and precarious means of attaining even a limited object. For naval reconnaissance he says they have their uses, but even their best sphere of activity over land—the night raids over England and other enemy countries—is being taken over with greater efficiency and less risk by the large fighting aeroplane.

The greatest value of the Zeppelin lay in its moral influence in the early days of hostilities before its limita-

tions were realised by the masses. The military authorities in Allied countries were never in any doubt as to the vulnerability of the dirigible balloon, but the people were unconvinced by all assurances until concrete proof was furnished.

It is another instance of the effect of popular opinion on military operations in modern days that much valuable time has been wasted on attempts to produce similar craft in this country when every effort was necessary in the manufacture of aeroplanes.

### THE SUPERIOR AEROPLANE.

In reconnaissance the use of the aeroplane is now clearly understood. "This comprehensive survey of the enemy was something new. Cavalry had never been able to achieve anything comparable to it, even in former times, when their opportunities for reconnaissance were not restricted by the effectiveness of the weapons employed against them to anything like the same extent.

Moreover, aircraft render very notable services in direct co-operation with the infantry as well as in the observation of artillery fire."

He also speaks of bomb-dropping. In the manner of an excuse he says: "In the course of these raids some unfortified places without military significance have had to suffer. The bombardment of these places is in itself objectionable, but the limits of what is permissible are in this matter in many ways elastic. A new weapon opens up its own paths, as is shown, for example, by the submarine war. In any case, in this contest of nations with its economic background, the war is turned more and more against the enemy countries, and the principle hitherto accepted that war is made only against the armed power of the enemy is, in this case as in other spheres, relegated to the background" (pp. 57 and 58).

[Which is precisely what this paper has been saying in other and plainer words for the last three years, while our newspapers have been bleating hypocritically about the "murder of civilians."—ED.]

### FRIGHTFULNESS.

There is little question that the methods of war, except in regard to the treatment of the wounded and of prisoners, are modified constantly by the conditions of the struggle. The habits of one belligerent can be copied in the habits of his opponent, therefore each new departure has its available and effective answer. Such cardinal breaches of international law as the dissemination of the germs of an interesting disease so selected as to destroy with a loathsome perfection the enemy legions is excluded from practice because of the certainty of its reaction on the army employing it.

No means of causing death is improper in war, save when that death is unnecessarily or needlessly brutal. If man can be killed pleasantly, there is little cause to destroy him cruelly. The moral effect of the well-designed atrocity is the reverse of what is commonly thought. Rage and determination and not fear and indecision is frequently the result of a reversion to barbaric methods of war.

### RETROGRESSIVE METHODS.

The Baron von Freytag-Loringhoven says that "In regard to the weapons which have proved most effective in the hands of the infantry, this world war, incredible as it may appear, has witnessed to a certain degree a retrograde development." The fighting over long ranges with highly efficient rifles, so inaccurately prophesied by M. Bloch in the series of books and articles



Telephone:—

OFFICE ... 912 REGENT.  
WORKS ... 4762 KENSINGTON.  
281-2-3 WEMBLEY.

Telegrams:—

"SOCIABLE, PHONE,  
LONDON."

# HOOPER & CO. LTD.

**AEROPLANE BUILDERS  
TO H.M. AIR COUNCIL.**

**MOTOR-BODY BUILDERS**

TO



BY ROYAL WARRANT.



BY ROYAL WARRANT.



BY ROYAL WARRANT.

HIS MAJESTY THE KING.

HER MAJESTY THE QUEEN.

HER MAJESTY QUEEN ALEXANDRA.

H.I.M. MARIE DOWAGER EMPRESS OF RUSSIA.

H.R.H. THE DUKE OF CONNAUGHT.

**HOOPER & CO. are also Coachbuilders to**

H.M. The King of Spain.

H.M. The King of Norway.

H.M. The Queen Mother of the Netherlands

H.R.H. The Princess Royal.

H.R.H. Princess Louise, Duchess of Argyll.

H.R.H. Princess Victoria.

**54, St. James's Street,**

**PICCADILLY, LONDON, S.W.1.**



which horrified to a high degree the pacific populations of the last decade of the nineteenth century, does not exist.

The bayonet, deemed to be abolished for all practical purposes when the more modern rifles were designed, became the arm of most common use in the earliest days of the war. In open warfare the fighting was largely hand to hand, as in the days of Senlac or of Cressy. When trench warfare became common, but a few yards of broken ground intervened between the opposing lines.

The grenade, popular in the days of Turenne and Marlborough, was revived from its place in the mists of history to take a vivid part in the contests of to-day. M. Blondel, a Maréchal de Camp in the army of Louis XIV, who wrote in 1690 a treatise on "L'Art de Jetter les Bombes," would find himself to-day capable of undertaking the training of the modern grenadier. The plates of his work, different though the costume of the troops might be, would not be unintelligible to-day.

#### THE NEW INVENTIONS.

He pays a tribute to the chemists of Germany for all that they have done to further the art of extinguishing human life, and compares the chemistry of his nation very favourably with that of other countries.

To Tanks, the pride of the press, and the most frequently invented of all weapons of war, he makes but brief reference, and does not give any opinion as to their value as a weapon. It is a somewhat surprising omission, as one would have expected from the German Staff a strong condemnation of their use.

As to munitions he says, as has already been indicated many times in this paper, that "The supplies of artillery ammunition which had been provided for

the war proved in the case of all the belligerent States to be very far below the requirements. Especially in the late autumn of 1914, our troops found themselves more than once in a critical situation as a result of this shortage" (p. 62).

The latter sentence, which indicates a state of affairs which was well known to the soldier, but was not revealed for some reason to the civilian in this country, provides an adequate explanation for the sudden failure of the German troops to continue their victorious advance and attain their objective early in the war.

#### THE PLACE OF FORTRESSES.

Trenches in their modern form he speaks of as fortifications which will in the future take the place of fortresses. "In any case it is certain that the old-fashioned fortresses are worthless, and, moreover, that the earlier notion, handed down from the Middle Ages, that positions had to be secured by means of fortresses must finally be abandoned" (p. 64).

It has been the general military opinion in England and in Germany for the last generation that fortresses even of the type protecting Liège, Namur, and Antwerp would be valueless when attacked by modern artillery of precision and power. In fact, so strongly was this view held that the power of artillery was overestimated in the days of peace.

The war has proved that, in order to make any pronounced effect, the number of guns employed must be vast. The slow retirement of the Germans before bombardments of unexampled intensity illustrates clearly the old truth that in war it is neither one arm nor one weapon that attains victory, but the united effort of the entire army.

(To be continued.)

#### THE POWER OF THE PRESS.

The following leading article from the "Morning Post," of Feb. 7th, is too funny to be confined to the readers of that excellent paper:—

We have, of course, the greatest respect for the profession of journalism; but we confess to a feeling of diffidence and even concern when we consider the power of the Press in a modern Democracy. A newspaper is after all a sort of gigantic megaphone: it repeats in a million ears the opinion of one man. not only so, but one man may have many megaphones, so that his voice addresses in different tones the whole nation, and repeats the same words in different accents until they seem a commonplace and are accepted without question.

The public does not know by whom it is addressed, and may think it is hearing the independent opinion of many when what it hears is the concerted opinion. Does anyone know, for example, how many newspapers and periodicals are owned and influenced by Lord Northcliffe? The voice that rocks the cradle in "Home Chat" rules the wave in the "Union Jack," and those deep reverberations in the giant "Times" find tiny echoes in "Forget-Me-Not." He is in every mood: if the nation is hilarious Lord Northcliffe laughs with them in "Comic Cuts" or "Illustrated Chips"; if it is religious it turns to the "Sunday Companion"; the lady takes her fashions from Lord Northcliffe; the racing man his tips; the business man follows him in the City; the countryman plants his garden according to Lord Northcliffe's directions.

If he does not put down the mighty from their seats, it is not for the want of trying, and he certainly exalts them of low degree. Even the Prime Minister trembles at his nod.

Such is the power of the modern newspaper magnate. But there is a new development. The newspaper proprietor is advancing from the sway of opinion to the throne of actual power. We are in some danger of having a newspaper Administration in this country.

Consider the position. Lord Northcliffe is a member of the Government, for he is chief of the American Mission. What he says is law to the "Times," the "Daily Mail," the "Evening News," and the "Weekly Dispatch," to mention only a few of the greater instruments in the Carmelite orchestra.

Lord Rothermere is Air Minister, and he commands the "Sunday Pictorial" and the "Daily Mirror." Sir George Riddell is supposed to be one of the most influential advisers of Mr. Lloyd George—a journalist without a portfolio, we might call him—and he sways the "News of the World" and the "Western Mail."

Sir Henry Dalziel is in a similar position, or so the rumour goes, and "Reynolds" and the "Pall Mall Gazette" do his bidding.

And now we hear that Lord Beaverbrook is to be put in charge of foreign propaganda. We surmise that he is designed to occupy the place of Sir Edward Carson, and we venture to predict that in a month or two he will be in the War Cabinet, as one of the Northcliffe organs confidently announces already. Now Lord Beaverbrook is said to control the "Express."

Here, then, we have a junta not of journalists but of the lords of journalism. They say unto an Editor, Go, and he goeth, and to another Come, and he cometh. When they "tip the wink" if we may use a vulgar expressive term, a thousand voices take up one cry. And this is what is called public opinion. It seems to us that public opinion is the Government and the Government public opinion. It is not a healthy state of things.

Let us consider the case of Lord Beaverbrook. A few years ago he was unknown to this country, although we understand that in Canada he was a successful financier. But at the present moment, so dazzling is his progress, we hesitate to say upon what rung of the Peerage he at present stands.

As to foreign propaganda, we are prepared to swear that he knows little or nothing about it. But then Lord Northcliffe knows little or nothing about America, and Lord Rothermere little or nothing about aeroplanes. What is important about these gentlemen is not that they can manage their departments but that they can manage the public. That is their real work. The rest does not matter.

If Lord Beaverbrook manages the Lloyd George propaganda in the "Express," let the Germans do as they please elsewhere. Germany may choose an expert for the work: England rightly prefers the more democratic way: and puts an ignominium into one job because he is expert in another.

It may be all very well in peace, but for ourselves we sometimes remember that after all we are fighting for our lives, and that war has an art to find out ignorance. So far the country has not prospered upon this system of putting men into jobs because they are useful for something else.

Although the lords of the newspapers sing in laudatory and eternal chorus, like the Cherubim and Seraphim, the public remain angry and dissatisfied. It may even be discovered, when it is too late, that war is an expert and critical business in all its branches, and that the greatest and strongest country may be brought to nought by a Government expert of opinion but ignorant of reality.





# ROLLS-ROYCE

*Contractors to H.M. Government.*

## ROLLS-ROYCE AERO ENGINES LIKE ROLLS-ROYCE CARS ARE

*THE BEST IN THE WORLD.*

THE WORLD'S RECORDS ARE  
HELD BY ROLLS-ROYCE AERO ENGINES

### CLIMBING

An aeroplane fitted with ROLLS-ROYCE engine holds the WORLD'S RECORD FOR RAPID CLIMBING.

### SPEED

An aeroplane fitted with ROLLS-ROYCE engine holds the WORLD'S RECORD FOR SPEED in the air.

### RELIABILITY

An aeroplane (Handley Page) fitted with ROLLS-ROYCE engines holds the WORLD'S RECORD FOR LONG DISTANCE FLIGHT under war conditions viz.: London to Constantinople.

### WEIGHT CARRYING

An Aeroplane (Handley Page) fitted with ROLLS-ROYCE engines holds the WORLD'S RECORD FOR WEIGHT CARRYING - viz.: London to Constantinople total weight SIX TONS

### PASSENGER CARRYING

An aeroplane (Handley Page) fitted with ROLLS-ROYCE engines holds the WORLD'S RECORD for carrying 22 PERSONS to a height of 7,000 FEET..

ROLLS-ROYCE, Limited, 14 & 15, Conduit Street, London, W.1.

Telegrams: Rollhead Reg., London.

and at

Telephones: 1654 Gerrard (3 lines)

Paris, New York, Petrograd Madrid, and Bombay



## WORLD'S RECORDS.

The following letter has been received:—

Royal Aero Club, 3, Clifford Street, W.  
February 11th, 1918.

Sir,—May I draw the attention of yourself, your readers, and more particularly that of the Competition Committee of the Royal Aero Club to the recent advertisements issued by Rolls-Royce, Ltd., and their claim to certain "World's Records" contained therein, for I feel one cannot let them pass without some inquiry?

To take these claims in order:—

Firstly "Climbing": Did this "World's Record" start from ground level, and up to what height did it continue? Are there special rules governing conditions for rapid climbing records? Were these rules observed? If so, under what supervision—Royal Aero Club, or Fédération Internationale Aéronautique?

Similarly with regard to their "World's Record" speed: At what height was the speed taken and under the rules of what governing body?

With regard to the three final claims, "For Reliability, Weight Carrying and Passenger Carrying World's Record" I note the first two are claimed as under war conditions. It is surely an irregular and, unquestionably, an extremely unhealthy and improper precedent to set for some splendid war exploit, in which the pilots, observers, and mechanics responsible are jointly concerned, to be used for commercial purposes in this particular manner, and blazoned forth in advertisement pages as a "World's Record."

With regard to the final claim as to the number of persons lifted to some particular height, if my memory serves me right, the F.I.A. rules lay down for a record of this description a minimum weight for each passenger, or possibly in alternative an aggregate weight for the whole of a given number. Was this condition fulfilled? If so, again, was any representative of a proper governing body present to certify this?

You will readily understand that I have no wish to cast doubts on the *bona fides* of Rolls-Royce, Ltd., but like many of your readers I am somewhat surprised that a firm of such high standing, and with their splendid record, should claim these records without quoting the authority of the governing body of the Sport of Aviation.

I would, therefore, like to urge very strongly that where advertisements claiming records, "World" or otherwise, are concerned the proper competition rules of the governing body involved should be observed. Thus one will not be tempted to use the words of old "By what authority doest thou these things, who gave thee this authority."

(Signed) HENRY KNOX.

## AIRCRAFT IN THE HOUSE.

On Feb. 5th Mr. Butcher (York, U.), asked the Under Secretary of State for War whether he had now any official information to the effect that hundreds of British and French officer prisoners of war had been sent to Stuttgart and other places in order to be subject to the risk of air raids; and whether he would take steps to inform the German Government that if and so long as they indulged in such practices German prisoners of war would be brought from Donington Hall and elsewhere to London and other places, where they would share with women and children and other non-combatants the dangers of attacks from the air by Germans.

Mr. Macpherson (Ross and Cromarty, L.).—Information has been received which leaves no doubt that the German authorities have placed officer prisoners of war in localities which are specially subject to air raids. Similar action is contemplated in this country. (Cheers.)

[It seems rather a pity that the Commanding Officers of the "Emden" and "Blucher," and young von Tirpitz were sent back to Germany before this decision was made. However, perhaps a few of our former Cabinet Ministers and of our international financiers would do instead.—Ed.]

Mr. Macpherson, replying to Mr. Anderson (Sheffield, Attercliffe, Lab.), who asked for the name of the member of the House who in his private capacity suggested the scattering of leaflets from Government aeroplanes over Coventry during the recent industrial trouble, and whether he was aware that the use of aeroplanes for this purpose, together with the character of the leaflets, had been much resented, said:—I am not aware that resentment has been aroused, as my hon. friend suggests, but as such a case is not likely to recur, I hope that the incident may now be regarded as closed.

Answering a supplementary question, Mr. Macpherson said that the member who suggested the scattering of the leaflets was his hon. and gallant friend the member for the Harwich Division of Essex (Major Newton).

## MORE AIR OFFICES.

In view of the urgent demand for increased accommodation for Government purposes, several important buildings are, says the Press Association, to be taken over by the Office of Works. Over

150 demands for further accommodation have been received, many of the most pressing character, and Sir Alfred Mond, First Commissioner of Works, informed a Press representative recently that it has been decided to authorise the commandeering of a large number of buildings on the west side of Kingsway, between Campbell Street and Great Queen Street, in order to meet the urgent need for increased accommodation necessitated by the expansion of the Air Board.

"It may seem surprising to some people unacquainted with the magnitude of the Air Council," said Sir Alfred Mond, "that the accommodation already possessed requires such an extension of space, but I may say that the most careful examination of the present premises has been made by the inspectors of the War Cabinet Committee, and their report made the taking over of additional buildings absolutely imperative."

"With the development of the aeroplane programme, under the able management of Sir William Weir, the Aircraft Production Department has grown to an almost incredible extent, and at the present moment it is of vital importance that other considerations should give way in all matters affecting its effective organisation and development. It will be necessary to secure the new buildings without a moment's delay."

## THE GERMAN AIRCRAFT EXHIBITION.

Officers and cadets of the R.F.C. now in training in this country can obtain admission to this exhibition, when in Town on leave, by applying to the O.C. their particular unit.

As the result of the recent notices in THE AEROPLANE this office is continually receiving complaints that employees in aircraft firms who wish to inspect the German machines cannot obtain the necessary passes from their employers. In almost every case it seems that the passes have been sent to the firms and have been appropriated by individual managers or foremen who do not realise that the said passes are not necessarily for one person only but can be made available for several persons at a time, provided that they write their names on the ticket, so that the signatures agree with their signatures in the visitors' book.

In a great many cases it seems that the passes have been in the firms' hands for a considerable time, and yet the employees who would like to see the exhibition have never been informed that they could do so. This seems to indicate both selfishness and lack of intelligence on the part of the people into whose hand the passes have fallen. One, therefore, strongly recommends the chiefs of the various aircraft firms to take a personal interest in the opportunity thus offered by the Air Council of educating their employees.

It is suggested that in each shop of every aircraft factory a notice should be posted saying that employees who are sufficiently interested in aircraft to wish to visit the exhibition of German aeroplanes in their own time can be supplied with the necessary passes by making application in writing to the Head Office.

It should also be stated in the notice that the number of passes available at one time is limited, and that therefore the passes will be issued in order of application.

In order to encourage education still further, the Authorities are willing at any time to arrange for a collective pass for a party of men from any firm in charge of some responsible person, say the local Production Officer or one of the Directors. And to suit the convenience of such parties arrangements can be made for the exhibition to be opened on a Sunday, if so desired.

## LORD MONTAGU IN CANADA.

Lord Montagu of Beaulieu, who has now probably arrived in India, where he is to act as an Inspector of Aerodromes and other aeronautical concerns, has had a splendid reception in Canada, where he has been addressing crowded meetings.

It will be remembered that last year, while in the Mediterranean, the "Persia," in which he was travelling, was torpedoed, and he himself was nearly drowned. On his journey to Canada last month another accident befell him, for his ship ran down another vessel and nearly sank herself in the process.

## WHAT'S IN A NAME?

Princess Arthur of Connaught opened an exhibition and series of lectures on Feb. 11th at Harrods, Brompton Road, held under the auspices of the Ministry of Labour in connection with the Waacs, the Wrens, and the Royal Flying Corps.

Brig.-Gen. Hutchison said that Sir Douglas Haig considered that our splendid women, in standing by our hard-pressed men in France, had proved themselves a power and a force far exceeding their actual numbers. Brig.-Gen. Livingston said the Women's Air Force would be called the "Penguins."

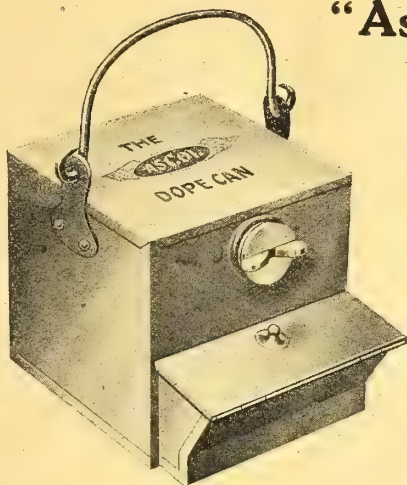
[One was under the impression that the word Penguin applied to ex-pilots of the R.N.A.S. and R.F.C., now employed on ground jobs, as indicating that they have wings, but do not fly, and also have permanent cold feet. The Kiwi, a wingless bird, has been appropriated for the entitlement of Equipment Officers, for obvious reasons. Possibly, therefore, the R.F.C. ladies should be known as Shemus, which is apparently the feminine of 'Emu.—Ed.]



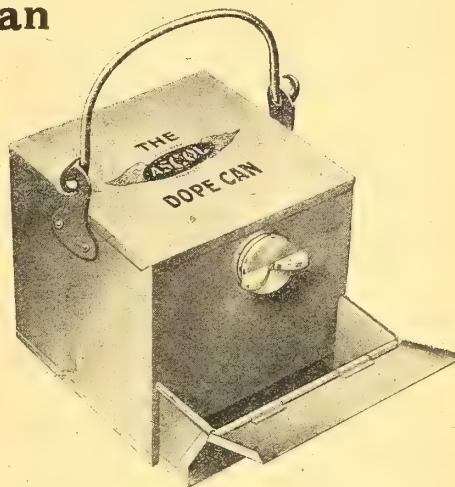


## "ASCOL" SPECIALITIES.

### "Ascol" Dope Can

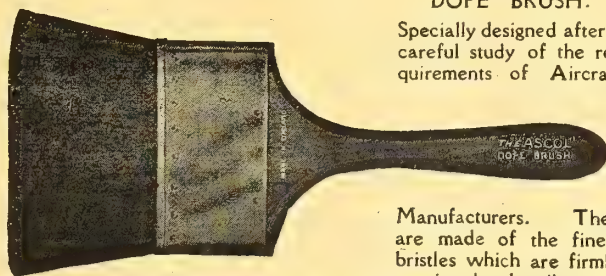


has been specially designed with a view to economising dope. The brush can be strained before being taken out of the can. The can is easily filled, and is constructed to hold the right amount of Dope for a morning's work. It is made for hard and rough wear, and will be found exceedingly handy, durable, and invaluable for doping purposes. Can be supplied with manufacturer's own name on can without extra charge.

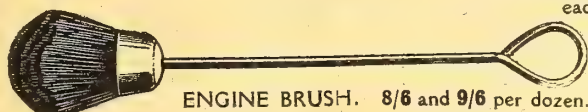


### "ASCOL" DOPE BRUSH.

Specially designed after a careful study of the requirements of Aircraft



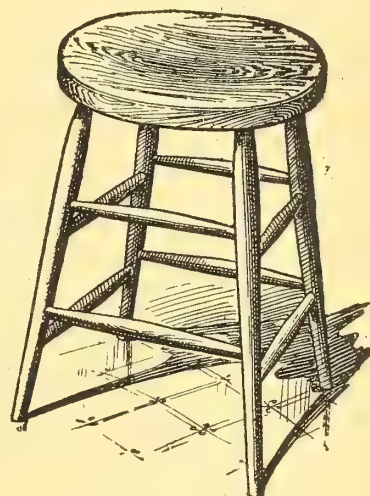
Manufacturers. They are made of the finest bristles which are firmly set in the handles.  
2in. 2/6, 3in. 4/-, 4in. 5/- each.



ENGINE BRUSH. 8/6 and 9/6 per dozen.



MOP BRUSH. 4/2 per dozen.



FACTORY STOOL (Wood).  
24 in. high 6/6 each

For full particulars of these and other items see "Aircraft Supplies," our Fortnightly House Journal. Sent free to the Aircraft Industry on application on business stationery. Illustrated Leaflets dealing with these and other "Ascol" Specialities are now in course of preparation and will be sent free upon request.

## THE AIRCRAFT SUPPLIES COMPANY LTD

CONTRACTORS TO THE AIR BOARD.

Head Offices, Showrooms, and Stores:

ASCOL HOUSE, 125, LONG ACRE, LONDON, W.C.2.

Representatives in Birmingham, Manchester, Leeds, Belfast, Northern Counties and Scotland, South Coast and the London District.

Managing Director:  
G. H. MANSFIELD.

Works:  
Little James St.  
London, W.C.1.



Telephone:  
Gerrard 276.  
(Private Branch Exchange.)

Telegrams:  
"Upcast, Rand,"  
London.

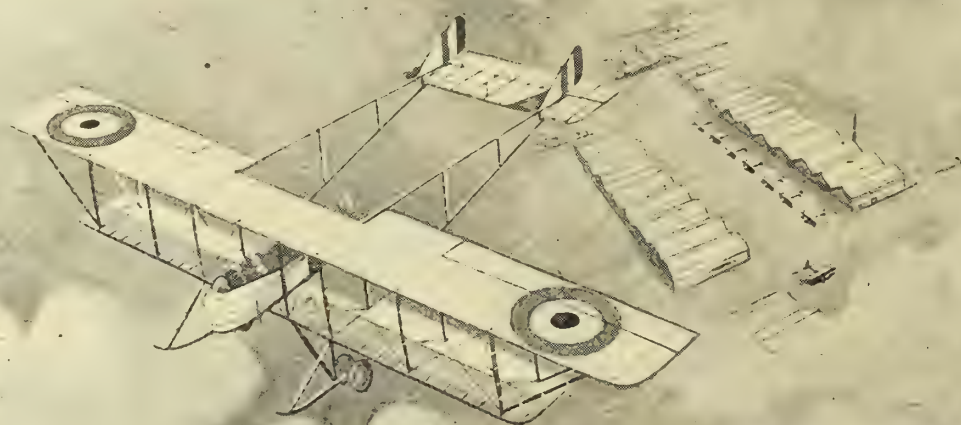
KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





# WHITEHEAD

## AIRCRAFT



**RICHMOND**  
SURREY

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



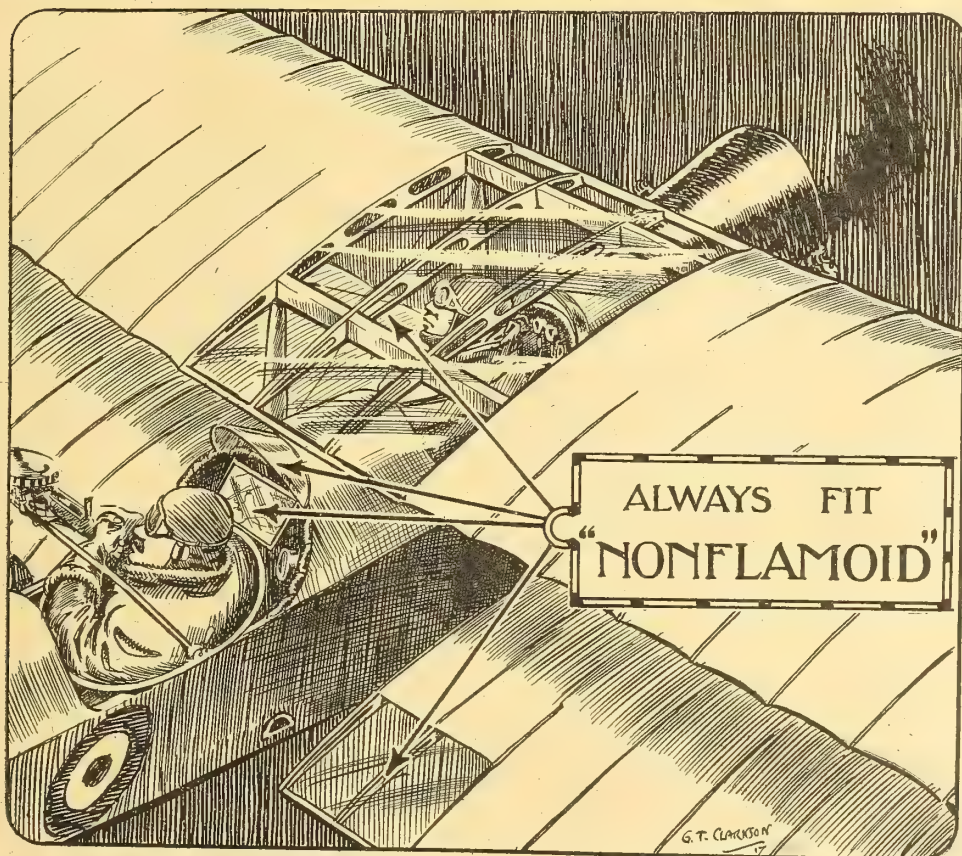
# "NONFLAMOID"

REGISTERED

NON-INFLAMMABLE CELLULOID  
FOR  
WIND SHIELDS, WING COVERINGS  
OBSERVATION PANELS, & MAP COVERS

## SPECIAL NOTICE.

We have on hand a considerable quantity of "Nonflamoid," in strips, 48in. x 7in., and can consequently give immediate delivery of Windscreens or Panels of dimensions not exceeding the above.



## The LONDON LABEL CO., Ltd.

*Contractors to H.M. Government,*

**HARLEY WORKS, BECKTON ROAD,  
LONDON, E 16.**

Phone—East 1300.

Telegrams—Lonlabel, Canning, London.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



“ “ CONTRACTORS TO “ “  
HIS MAJESTY'S WAR OFFICE

*Messrs. Gordon Watney & Co. Ltd*

**AERONAUTICAL AND  
GENERAL ENGINEERS**

**South Lodge Motor Factory**

**WEYBRIDGE**



**Telephones WEYBRIDGE 550 (7 lines),**

**Telegrams: "MERCEDES, WEYBRIDGE."**



# AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER

## The British Aircraft Industry.

(SECOND SERIES.)

BY R. P. HEARNE.

### VI.—CELLON, LTD.

To get the idea of establishing an important business on one's way to a hockey-match is rather unusual. Rather more unusual is it to get this kind of idea on the way to a Saturday afternoon game, and on the following Monday set the thing going.

If I told you that an American had done this you would say, "What enterprising devils these Yankees are! If only we could do things like that!"

And if I said that a German had done it, we should hear the usual adulatory remarks about German organisation, German education, the benefit of the German military system, and so forth.

Of course, some cute critic would interject that they don't play hockey on Saturday afternoons in America or Germany—so that, after all, it could only have happened in the British Isles. [Or else he would have upbraided the teller of the yarn for not knowing the difference between base-ball and hockey and a *wurst*-eating match.—Ed.]

Anyhow, I bring the matter in, firstly, because it is true, and, secondly, because I am glad that it did happen on a Saturday afternoon, and as the prelude to a game of hockey. For with all due respect to superior people I believe that the Saturday holiday and our field games system are two great national institutions which will enable us to out-fight and out-stay the Germans. The history of the war will show also that we played the game all through.

#### LOCAL COLOUR.

It might have been better if I had worked this theme out as a Romance of Industry, and led off with a pen-picture of a tall, and thin, but athletic young Britisher striding out on a Saturday afternoon with his hockey-stick, and thereupon meeting the adventure which by Monday morning made him the founder of a new business. But then I would have been tempted to weave in so much local colour that the paper restrictions and the editorial blue pencil would cripple me.

I am just as glad that I must cut out this local colouring, for, of course, I would have to describe the hockey match, and it's such a long time since I have seen young men playing hockey that I would find myself writing of joy sticks instead of hockey-sticks; the ball would be a bomb: the nets would be for submarines; and the goal-posts could not escape being called gibbets for the Kaiser. How this war spirit perverts us!

### THE FOUNDER OF CELLON.

And now to business with the directness of Mr. A. J. A. Wallace Barr, Director and Secretary of Cellon, Ltd. It was Mr. Barr who in 1911 founded the business of Cellon Dope in the lightning manner already set forth. He sees nothing remarkable in the affair, however. It was merely that he saw an opportunity—and seized it.

Precisely why he saw and seized this opportunity, and why every other Tom, Dick and Harry who went out to play hockey on that eventful Saturday afternoon did not found dope businesses I shall now explain.

The basic fact of the whole situation was that Mr. Barr had been interested in aviation since 1906. Indeed, in search for further hereditary evidence bearing on the case I found that Mr. Barr's father had been a well-known pioneer in motor traffic. And his uncle, Mr. Harold Perrin, now Lieut.-Comdr. R.N.V.R., was and is the Secretary of the Royal Aero Club, and practically the man who has made that organisation what it is.

#### HOW IT HAPPENED.

Mr. Barr, on his way to the hockey match, met a man who was interested in the manufacture of cellulose. They discussed the subject; and when Mr. Barr heard of this liquid cellulose covering being applicable for waterproofing or preserving various articles it was almost natural that the thought should come to him that here was a good covering for aeroplanes. Had it not been for his previous interest in aviation he would not have perceived the need for a dope, or the applicability of cellulose. Unless one has some interest in or knowledge of a subject one does not see the opportunity for applying new developments.

At that time I believe that the usual surfacing for aeroplane fabric was sago, and Mr. Barr knew enough about the matter to realise that something better was most desirable. I do not know, and I have been unable to find out who first actually applied cellulose solutions as a dope to aeroplanes. Indeed, the early history of dope is wrapt in mystery.

#### THE CLAIM TO PRIORITY.

To the best of my own recollection the primitive aeroplanes were treated with a great variety of varnishings or coatings, and from my own investigations I should say that whilst Ger-



MR. A. J. A. WALLACE BARR.



many originated cellulose for purposes other than aviation, the French were possibly the first to experiment with this substance as an aeroplane dope.

But as regards this country Mr. Barr was certainly very early in the field, and the idea of a cellulose dope came to him in the curious manner I have detailed. He got to work very quickly, and soon had a small factory going at Clapham. There he prepared the stuff himself, and though he had no training as a chemist he seems to have produced a satisfactory article after many experiments.

A reference to him in *THE AEROPLANE* of that period brought him inquiries from Messrs. A. V. Roe and other pioneer British firms. The great S. F. Cody was another early user of Cellon dope, and when once the merits of the preparation were displayed there was a prompt demand for it, for, as I have said, there was great need for an improved surfacing on the fabric of aeroplanes.

By 1912 Cellon dope was extensively used, and in that year as in the following years the machines so treated were prominent in the various trials and contests. The new industry was now well established, and Mr. Barr showed his business ability by the manner in which he fostered it.

#### A GREAT CHEMIST.

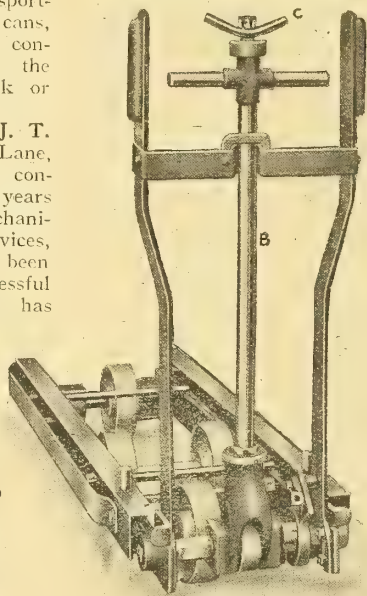
Seeing the need for expert assistance in perfecting the article he became associated with one of our foremost chemists, Mr. Thomas Tyrer, F.I.C., F.C.S., and by the help of Mr. Tyrer's firm the manufacture of Cellon was placed on a scientific basis. I came across Mr. Tyrer many years ago when he was doing splendid work for the country in the fuel problem, and I believe I am right in ranking him amongst our greatest manufacturing chemists.

The later history of Cellon is that of a successful and progressive business. A new factory was set up, and when the war broke out Cellon Ltd. was able to render splendid assistance by its enhanced output of dope. Needless to say the demand has grown in an amazing manner, and the industry is now carried out on a very big scale. But that Cellon Ltd. maintains a very important position in that industry cannot be gainsaid.

### SHOP TRANSPORT PROBLEMS.

The accompanying illustrations represent different styles of an apparatus called the "U-frame Jacktruck and Elevator," which is used for transporting and lifting boxes, cans, etc., which can be conveniently carried in the "U"-frame of the truck or elevator.

This is made by J. T. Hardaker, Ltd., Parry Lane, Bradford, who for a considerable number of years have specialised in mechanical labour-saving devices, the utility of which has been proved by the successful business this company has

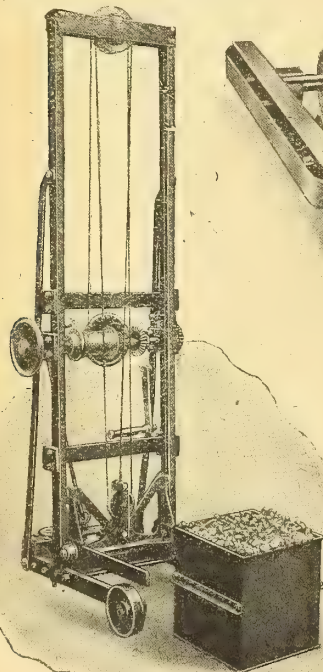


**A Jacktruck which carries heavy fittings on trays.**

done in them.

It is claimed that with the assistance of these appliances one man can do the work of five, and it is evident that the claims of the makers demand consideration.

**A Hardaker Jacktruck, constructed to carry small part bins.**



#### AN ABLE MANAGEMENT.

Mr. Barr as director and secretary has proved himself an admirable head of the business, and as a hard worker, alert and enterprising, he has shown his qualities in every emergency. With a firm like Tyrer Co. Ltd. to guide him on scientific points, and ably assisted by his right-hand man, Mr. W. J. Shilcock, Mr. Barr should be well able to keep Cellon in the front rank.

Able help in building up the firm's present high position has been given by Mr. T. Tucker, who is in charge of the manufacturing side of the business, and by Mr. Lazell who is in charge of the firm's well-equipped research laboratory.

Dopes, I need hardly say, have passed through many stages already, and unquestionably the limit of development has not yet been reached. The original preparations were most poisonous and highly inflammable. The modern dope has been rendered practically non-poisonous, and with suitable ventilation of the dope-shop the danger on this score has been removed. In the matter of non-flammability great progress has been achieved, and ceaseless effort is being made to bring about further improvements in every desirable direction.

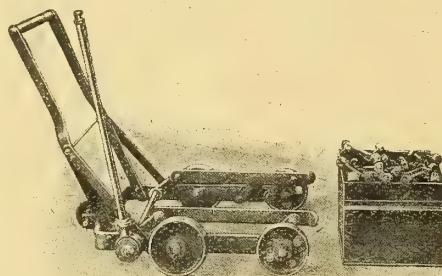
#### FUTURE PROJECTS.

Mr. Barr is a most progressive man, and he takes long views into the future. He is not in the dope business for the duration of the war merely. In his mind he is working out important projects for the future of the industry.

It would not be right for me to state what he told me as regards new applications of dope and similar materials to peace-time purposes, but he gave me a most remarkable list of possible uses for dope, should it happen that to-morrow or next day all the nations of the earth decided to settle down into eternal peace, and scrap all aeroplanes, as well as turning bayonets into ploughshares.

Of course, Mr. Barr sees the immense commercial future of aircraft, and in this branch of industry there will be a steady demand for large quantities of dope. But in addition it is highly probable that the progressive British dope manufacturers will be able to do a sound and steady business in many other directions when the war is over.

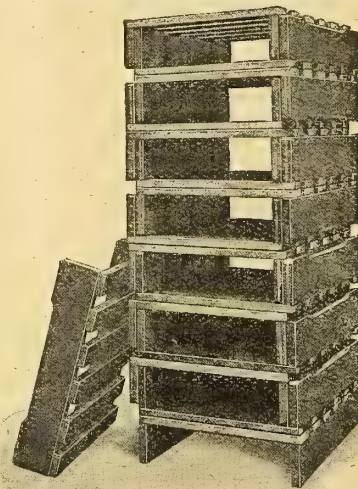
The truck is specially applicable for rapid transveying work in workshops where articles can be aggregated together in boxes. The "U"-frame can be made to surround ordinary boxes, and can usefully be employed in conjunction with hoists. One truck



**A Jacktruck for light work.**

can be used with 30 or 40 boxes, and is therefore equivalent to 30 ordinary transveying trucks. Being "all-metal" the durability of the trucks and elevators is a great factor in transporting where such a great deal of wear and tear is occasioned.

Other labour-saving devices produced by the firm are worthy of consideration, and readers interested are advised to write for illustrated catalogues, which deal fully with this problem, which at present demands the attention of all business men in view of the scarcity of labour.



**A Pile of Trays for the Jacktruck.**





# AIRCRAFT MANUFACTURING COMPANY———LIMITED

Contractors to  
War Office and Admiralty

London Office

27, BUCKINGHAM GATE, S.W.1.

Offices & Works

HENDON, N.W.9.

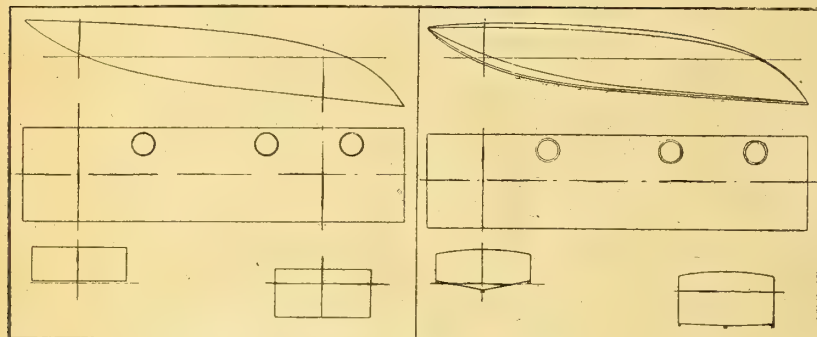


**FLOATS AND HULLS FOR FLYING BOATS.**

BY DWIGHT S. SIMPSON, M.M.E. (Palmer-Simpson Co.)

(From "Aerial Age," New York. Sept. 24th, 1917.)

Now that we are to spend so much money for coast defence and as much of it is likely to go into flying equipment, interest in water landing gear is becoming more widespread. Most flying men would rather try out a new machine over water than land, and a machine capable of landing on water seems more suitable for a sportsman's general use. For many reasons the demand for such machines is becoming greater all the time.



1.—Simplest Form of Steplless Pontoon.

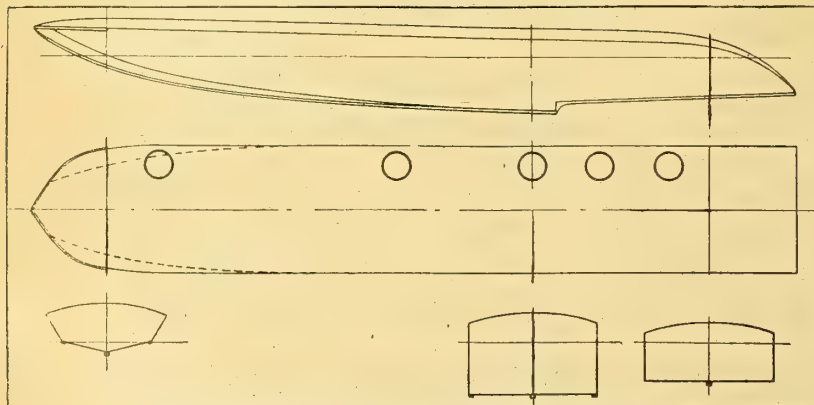
2.—Improved by V Bottom and Crowned Deck.

It is about eight years since the first machine got off the water and, almost from the first, development has been in two quite different directions, one school making the "flying boat" in which the fuselage and floating body are one, as distinct from the "seaplane" proper in which the wheels of the landing gear may be said to be replaced by water floats. The latter is again split into two divisions, the single and double float types. We will leave the flying boat for some other time and look into the mysteries of the seaplane float.

It is probable that both single and double float types will always be built, as each fills certain requirements that the other will not. When the requirements call for speed in the water or a maximum of useful cargo space the single float will be used, as it means less weight and air resistance for a given cubic capacity. For carrying torpedoes and large bombs the two-float system will be used as it provides considerable central space between the floats and the fuselage to hang heavy weights. Both have their disadvantages and their advantages in the water. The single float is unstable and requires small floats at the ends of the wings to keep the machine upright. These wing floats are not normally in the water, but as the machine heels they put a small planing surface in and throw it back to an even keel. Some builders fit the wing floats with a small light board which acts like a spring leaf as it touches the water. The single float is very

handy in smooth water, but unfortunately water at sea is rarely smooth and the wing floats are liable to get buried in a wave and the resulting strain is apt to rack the wings badly.

While the two-float system is more apt to yaw due to one float being temporarily submerged by a wave, the strain can be all taken up by the chassis and fuselage structure, thus leaving the wings undamaged. A greater margin of safety is provided by two floats as it is easy to make each large enough to support the entire machine in case the other is damaged. Practically



4.—Slanting the Sides Forward to Keep Down the Spray.

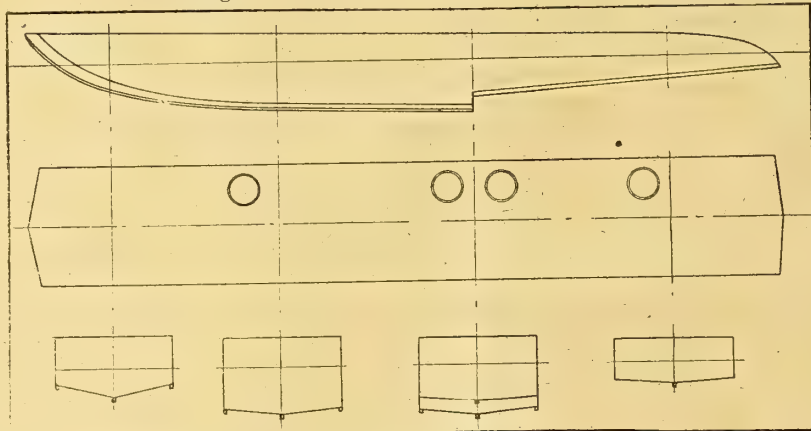
this is accomplished by giving each float about 75 per cent. to 90 per cent. reserve buoyancy and then dividing it into several watertight compartments. The single float has from 110 per cent. to 125 per cent. reserve buoyancy.

Almost every form of float has been tried in the effort to find the ideal and until recently the hand of the naval architect was conspicuous only by its absence. Even the knowledge gained by ten years of hydroplane racing was little used. To-day the most efficient forms are directly adapted from hydroplane design with such modifications as tank and practical experiment have found necessary to fit the float to its work. The sketches herewith show the forms most in use to-day.

Besides its work as a hydroplane the float must be considered from the standpoint of its air resistance and the ease (or difficulty in many of the first ones) with which it can be raised out of the water. These influence largely its shape in all respects except the bottom. The above water portion of an ordinary boat is largely designed to keep out spray and solid water and to look well. In a seaplane float we forget all these and design to get through the air with least resistance and to apply its wind pressure in the least objectional direction to the rest of the plane. The nearest we can come to a streamline form the better the job we have.

We design our float then from three positions as it were. First in the water we want a certain planing speed. By intelligent adjustment of the weight, power and planing surface the float or floats may be made to plane at approximately any desired speed.

This speed is about that at which the aeronautical engineer has decided that the machine will fly. Unfortunately for us who design floats he has also fixed the weight and decided upon the



3.—Simple Pontoon with the addition of a Step and Tail.

engine. We have therefore only one variable; the beam of our float. It is well to remember that it is not wise to plane too soon as the wings may not have taken charge—especially when running down wind—and there is neither pleasure nor profit in hopping about from sea to sea, "porpoising," as they appropriately call it. It is well therefore to have the planes carrying some weight before the float reaches its maximum speed in the water. Thanks to Mr. Linton Hope we can very closely estimate this speed for any set of circumstances. He has evolved a formula for seaplane use which may be put as follows:—

$$\text{Speed in knots} = \sqrt[2.5]{\frac{P \cdot C \cdot L}{W}}$$

in which a knot is 1.15 miles

P is E.H.P. of engine

C is  $\frac{B}{138950L}$

L is length (in feet) of pontoon to step

B is beam of pontoon in feet

W is weight in pounds of complete machine and crew.

From an inspection of the above it is seen that we can control the speed largely through modification of the beam. In the two-float system the combined beam of the floats should be about 25 per cent. more than given by the formula.

When in the air, floats of any form cease to





## AN ERROR MAGNIFIED 1,000 TIMES.

THINK what this means when a quantity of work has to be gauged to a standard. Think of the saving in time and money by having ready at hand an instrument on which readings may be taken to  $\frac{1}{15,000}$  part of an inch at the rate of about 60 per minute if necessary.

The bugbears of micrometer and special gauges *can* be eliminated, and disputes between viewers and inspectors speedily settled by the use of

*The* **Prestwich** FLUID **Gauge**  
Accuracy to the ten-thousandth part of an inch with ease.

The Prestwich Fluid Gauge not only tells immediately if the work is within the limits, it also definitely indicates the **EXACT AMOUNT** of any error. Sense of touch is also eliminated, skilled viewers are not essential, and **THERE ARE NO WEARING PARTS.**

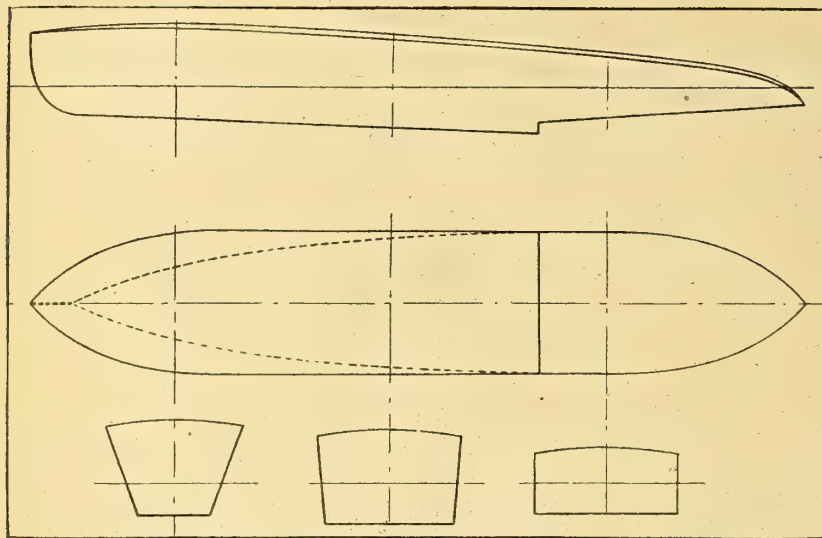
Do you have to work to fine limits? If so, you cannot afford to be without the Prestwich Fluid Gauge. The instrument will save its cost in a few weeks. Write us to-day for full particulars, stating any special purpose for which you require accurate gauging—and let us demonstrate the instrument to you—we have all kinds of adaptations

*Why not write for our illustrated booklet TO-DAY?*

**J. A. PRESTWICH & CO., Northumberland Park, TOTTENHAM, N. 17.**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





5.—British Method of Reducing Spray. Note the Flat Bottom.

be of use and become mere impedimenta and therefore require special consideration to make them as little obtrusive as possible. Much money has indeed been spent in an endeavour to make collapsible floats which can be taken in when in the air. The difficulty seems to be that they collapse at the wrong time and generally in the water.

Weight is the first item of interest after form and this is largely a matter of construction though the Richardson float combines the most favourable lines with respect to air resistance and the lightest possible section from the builder's standpoint. The usual boxlike form is not in itself either strong or rigid, but forms merely the watertight covering of an intricate system of truss work. It is therefore a heavy boat to build. My friend Mr. Archibald Black has reviewed a number of floats of this type and says that the average weight of a pontoon is .089 lbs. for each pound of its total submerged displacement. In the Richardson type this appears to be about .073 lbs.

The floats must be so hung that their actual air resistance is not converted into an undue number of footpounds influence on the aeroplane as a whole and so requiring too much inclination of the horizontal tail planes. This, however, as well as the balancing, is up to the aeronautical engineer.

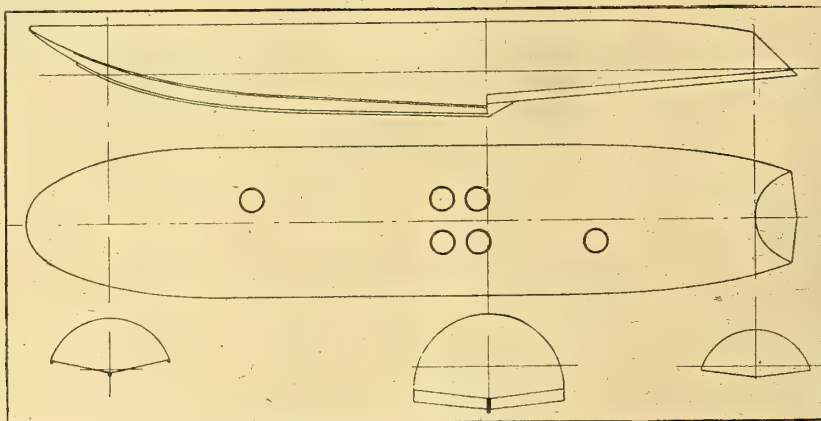
The most critical test of the form of a float is at the moment of leaving the water, as this is the most difficult condition it has to face. Many an inexperienced designer has brought his new seaplane up to the speed where his figures have told him that the next increment will lift it from the water, only to feel something wrong and settle back for a new try. Perhaps there are dozens of tries before getting away and it has often happened that he didn't get off the water at all. The plane might have been a wonder but the floats were but boxes stuck on to support it for a moment only.

It has been found that water has a peculiar affinity for curved surfaces but dislikes to follow around a sharp corner. It would seem politic therefore to join all surfaces that are below the water, when the plane is moving, with a sharp corner, and to make all surfaces flat or possibly convex (the corners are sharper then). The water will then break from them and by letting the air to the surface will release the float. No one would think of making the corner of the step round, and it seems obvious that all other corners should be as sharp. Hydroplane designers long ago came to the so-called "V" bottom to obviate as much as possible the hard pounding of the waves. For the same reason

it has been adopted on the later seaplane floats. It materially relieves the jar of landing, nor is the machine so liable to porpoise in getting away. When the bottom of the tail is "Veed", it seems to clear much easier than the usual flat bottom.

The step is an item that seems to puzzle many. Its explanation begins at the beginning of the hydroplane. A hydroplane is so called because it rides on the surface of the water instead of cutting through it as a "displacement" boat does. It rides on the surface because the pressure of the water is converted into a vertical pressure on the bottom planes. In order to do this the planes must be set at a small angle to the horizontal line of advance (from three to five degrees). If this plane were continued to the end of the boat it would be very deep in the water and give unsatisfactory service. If it were rounded up toward the stern there would be cause for squatting, therefore it is broken off sharp and the boat is moving so fast that the water breaks right away from it and not make an eddy retarding the speed.

To assist the operation and prevent a vacuum behind the step air is led in through tubes or "breathers" which extend from just behind the step right through the boat. The step need not be more than three inches deep. Now a hydroplane may be, and is, built with one step, two steps, many steps, or none. So may one build an airplane float, but because the airplane has to leave the water and to do so must rock slightly about its centre of gravity, more than one step is not practical, and if the float is not more than ten or twelve feet long, it is better without any. The step should be located not more than, say, three feet behind the centre of gravity of the entire machine (to permit of rocking).



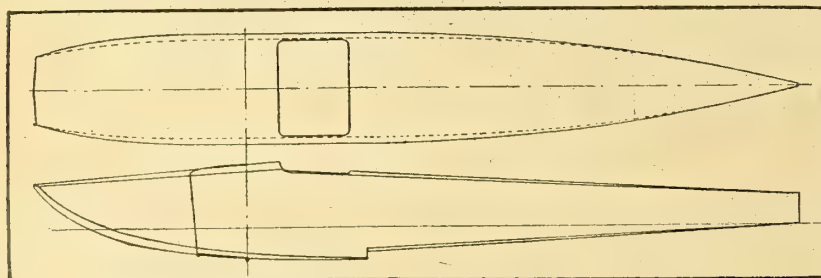
6.—The best American practice to-day—the Richardson Float.

and this means that the stern of a stepless float comes at that location. We therefore find it necessary to put a small float under the tail to hold it out of the water when the plane is at rest. This lifts nearly as soon as the machine starts but still provides considerable wind resistance and is not desirable. The main float must be made to project far enough forward to guard against tipping over that way; tripping, a sailor man would call it.

To avoid carrying that tail float most of us build on more float behind the stern and have what is generally known as a one-step float. Technically, however, we still have a stepless hydroplane with one planing surface. The bottom of the tail, or that part of the float behind the "step" is slanted upward toward the stern in order to clear it from the water as soon as possible and allow the machine to rock about the step in getting away. At no time does this part of the float assist in planing, and its sole use is to keep machine from falling over backward when it is at rest in the water. As another step spreads the waterborne area from two to three feet and makes the rocking of the machine difficult it may safely be said in view of the above that practically all seaplane floats and flying boats are stepless hydroplanes. There are a few others, of course, to "prove it."

Just as we want sharp corners and flat surfaces below water so we want round corners and well rounded surfaces above. They are lighter and stronger to build and allow all water which comes up over the top (and there will be a lot of it) to roll off as quickly as

(Continued on page 667.)



7.—A Typical Flying Boat Hull, with Flat Flaring Side.





# CELLON

— NON-POISONOUS —  
**DOPE**

**CELLON, LTD.,**  
Broad Street House, E.C. 2.

Telephones: London Wall 5359, 8622.  
Telegrams: "AJAWB London."



GEORGEY WATSON 1917

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# **GNÔME & LE RHONE ENGINE COMPANY**

**Contractors to the  
War Office and Admiralty**

**London Offices :**

**27, BUCKINGHAM GATE, S.W.1., and THE HYDE, HENDON, N.W.9.**

**Works: Blackhorse Lane, Walthamstow.**



**WOODSIDE ENGINEERING COMPANY, LTD.,  
POSSILPARK, GLASGOW.**

# **AEROPLANE TIERODS**

: IN :

**STREAMLINE AND ROUND SECTIONS**

COMPLETE WITH

**UNIVERSAL OR FORK JOINTS**

**LARGE STOCKS.**

**PROMPT DELIVERY.**

**Telephones.**

**WORKS: 1495 Douglas (2 lines.)**

**OFFICE: 3456 Central (3 lines.)**  
(Private Branch Exchange.)

**Telegrams: "FUSELAGE," GLASGOW.**

**Registered Office**

**50 WELLINGTON STREET,  
GLASGOW.**



**NON-POISONOUS  
DOPE**

**TITANINE**



THE  
**BRITISH AEROPLANE  
VARNISH CO., LTD.**  
166, PICCADILLY, LONDON, W.1

Telephone . . . . . GERRARD 2312.  
Telegrams . . . . . TETRAFREE, PICCOY, LONDON.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# AEROPLANE COMPONENTS

TRADE MARK.



MEANS LONG LIFE

If you are building or tendering for Aeroplanes write for our list.

It contains 300 full-size sectional illustrations of Weldless Steel Tubing, Reproductions of Component Parts, and Valuable Information.

We hold tools for parts of the following machines:—

**B.E. C.D.E. and B.E., R.E.**

**F.E. B. and D., F.E., S.E., AVRO,**

**BLERIOT, H. FARMAN,**

**SOPWITH (110 H.P. Clerget and F).**

We make and manipulate Weldless Steel Tubing, and produce Presswork in Sheet Steel to all Air Board Specifications.

With the approval of the Aero. Supplies Department we are now making Tubes for Axles, having ends polished to size, thus saving the expense of grinding. May we send you particulars, and also

**THAT EXCEEDINGLY USEFUL LIST ?**

Telegrams:

"Accles,  
Oldbury."

A.B.C. Code,  
5th Edition.



Telephones:

Oldbury, 111.

(4 Lines.)

**OLDBURY,**

**BIRMINGHAM.**

## ARNOTT & HARRISON LTD

Telephone—  
WILLESDEN 2297 (2 lines).

Telegrams—  
ARNOTHARRI, LONDON.

**SPECIALISTS IN ALL  
DE HAVILLAND  
METAL FITTINGS**

UNSURPASSED FOR  
**PROMPT DELIVERY.**

Hythe Rd., WILLESDEN JUNCTION,  
N.W.10.

**"A & H" SMALL PARTS TO THE RESCUE.**



# ALUMINIUM CASTINGS

OF EVERY DESCRIPTION.

We make a  
Speciality  
of  
Aeronautical  
and  
Automobile  
Work.

We are making many thousands of **Aluminium Die Castings** weekly under the celebrated **Cothlas** process—in many cases **entirely eliminating** machining operations, and we hold the sole manufacturing rights in the British Empire for this process.

Chemical and Physical tests are made on our own premises, and our **Castings**, both **Sand** and **Die**, are produced under the most up-to-date and scientific methods.

Sole makers of the **Birmal Aluminium Pistons**, thousands of which are running to-day in a highly satisfactory manner under the most severe conditions.

Highest  
Class  
Castings to "  
Government  
Specifications.  
Prompt  
Delivery.

**BIRMINGHAM ALUMINIUM CASTING (1903) CO., LD.**  
Cambridge Street Works, BIRMINGHAM.

Contractors to H.M. Admiralty, War Office and Foreign Governments.

## The BRITISH CAUDRON CO., LTD.

SOLE BUILDING AND SELLING RIGHTS FOR

**Caudron Aeroplanes  
and Hydro-Aeroplanes**  
FOR  
**THE BRITISH EMPIRE AND DEPENDENCIES**

*Head Office and Works:*

**BROADWAY, CRICKLEWOOD, N.W.2.**

Cable and Telegraphic Address: "CAUDROPLAN, CRICKLE, LONDON."

Phone: 4647  
4648 HAMPSTEAD

*Scottish Factory and Aerodrome:*

**ALLOA.**

Cable and Telegraphic Address: "CAUDROPLAN, ALLOA."

Phone: 52

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# The "Guardian Angel" Parachute



## THE REAL "GUARDIAN ANGEL" PARACHUTE

is now included amongst the exhibits at

### THE IMPERIAL WAR EXHIBITION at Burlington House.

#### INADVERTENTLY

the Exhibition Committee had displayed and catalogued a Service parachute of the Ordinary type as a "Guardian Angel" Parachute. Flying men who had not seen the "Guardian Angel" Parachute were puzzled at this exhibit, as they had expected to see something quite different from the Service pattern, with which most of them were familiar. The opportunity is now given of comparing the two equipments in detail.

The "Guardian Angel" Parachute, in all its different types, is instantly automatic in its opening; its parts are under absolute control, at rest and in action; entanglement of its rigging is rendered physically impossible; there is no **free-fall**; shock to the Aviator and Parachute is prevented; it is the only Parachute which can be dropped with precision and safety from an Aeroplane flying at any speed; the harness instantly releases the Aviator on landing or falling into water.

The Ordinary Service parachute possesses none of these advantages.

GO AND SEE BOTH AND JUDGE FOR YOURSELF.

RELIABILITY—First. RELIABILITY—Second. RELIABILITY—ALL THE TIME.

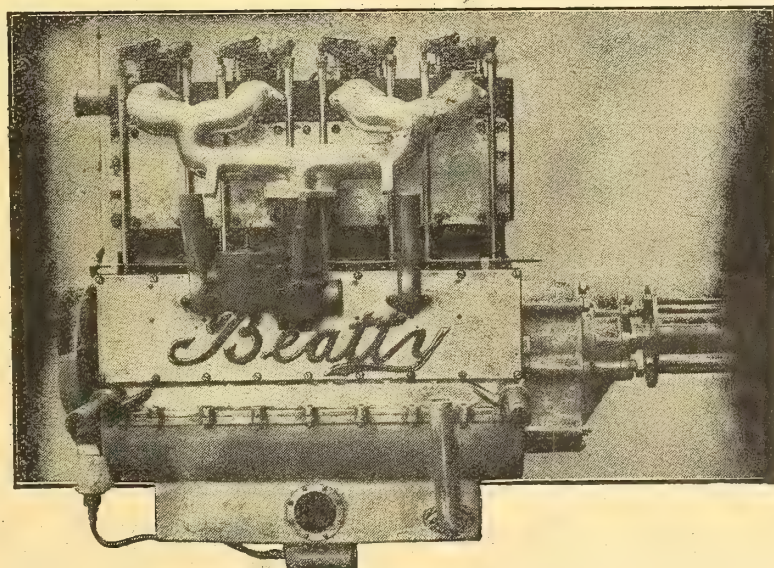
## E. R. CALTHROP'S AERIAL PATENTS, LTD.

ELDON STREET HOUSE, ELDON STREET, LONDON, E.C.2.

Telephones (2 lines): London Wall 3266 and 3267.

Telegraphic and Cable Address: "Savemalivo-Ave-London."

# The Beatty Monobloc Aero Engine



H.P. = 60.

R.P.M. = 1800  
Engine Shaft.

Prop. speed =  
1200 R.P.M.

Weight = 225 lbs

Petrol  
Consumption  
4.28 galls. per  
hour.

Oil  
Consumption  
.18 galls. per  
hour.

*Specially Designed and Developed for School Work.*

FULL PARTICULARS **The Beatty School of Flying Ltd.** LONDON AERODROME

Telephone . . . . Kingsbury 138.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





# The Aeroplane

## Acceptance and Experimental Flights—

The Procter Isaac Aviation Co. "Aeromonia, Piccy, London. Gerrard 278 (2 lines).

## Acetylene Welding Plant—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.  
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

## Aeroplane Manufacturers—

Aircraft Manufacturing Co., Ltd., Hendon. "Airmanship, Hyde, London."

Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle-on-Tyne. "Armstrong Aviation, Newcastle-on-Tyne." Gosforth 500.  
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.  
British & Colonial Aeroplane Co., Ltd. (The Bristol Co.), Filton, Bristol. "Aviation, Bristol." Bristol 3906.

British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudroplan, Crickie, London." Hampstead 5551.

Central Aircraft Co., Palmerston Works, High Road, Kilburn, N.W.6. "Aviduction, Phone, London." Hampstead 4403 and 4404.

Davidson Aviation Co., Ltd., Hammersmith, W.6. Hammersmith 1144-1145.

Eastbourne Aviation Co., Ltd., Eastbourne. "Aircraft, Eastbourne." Eastbourne 1176.

Graham-White Aviation Co., Ltd., London Aerodrome, Hendon. "Volplane, Hyde, London." Kingsbury 120.

Handley Page, Ltd., 110, Cricklewood Lane, N.W.2. "Hydrophid, Crickie, London." Hampstead 7420.

Hooper & Co., Ltd., 54, St. James St. Piccadilly, London, S.W. "Sociable, St. James, London." Regent 912.

Mann, Egerton & Co., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Martinsyde, Ltd., Brooklands, Byfleet. "Martinsyde, Weybridge." Woking 331; Byfleet 171.

National Aircraft Co., Ltd., 15, Hackney Road, N.E.2. "Nieuport" & General Aircraft Co., Cricklewood, London, N.W.2. "Nieuscut, Crickie, London." Willesden 2455.

Norman-Thompson Flight Co., Ltd., Bognor. "Soaring, Bognor." Bognor 48.

The Regent Carriage Co., Ltd., 126/132, New King's Road, Fulham, S.W.6. "Carbodies, London." Putney 2240-2241.

Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester." City 8530-8531, Manchester.

Saunders, S. E., Ltd., East Cotes, I.O.W. "Consuta, East Cotes." Cotes 193.

Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tested, Phone, London." Regent 378.

Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston." Kingston 744.

Standard Aircraft Manufacturing Co., Effingham House, Arundel Street, W.C.2. "Gunsgrush, Estrand, London." City 89.

Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickerlyta, Knights, Londoi." Kensington 6810.

Waring & Gillow, Ltd., Hammersmith. "Warisen, Ox, London." Museum 5000.

Westland Aircraft Works, Yeovil. "Aircraft, Yeovil." Yeovil 129.

White, J. Samuel, & Co., Ltd., East Cotes. "White, East Cotes." Cotes 3.

Whitehead Aircraft (1917), Ltd., Richmond Surrey. "Whitcraft, Richmond, Surrey." Richmond 1865.

Wycombe Aircraft Constructors, Ltd., High Wycombe, Bucks. "Aircraft, High Wycombe." High Wycombe 84.

## Airships—

Airships, Ltd., High Street, Merton. "Short Bros., Rochester, Eastchurch, and Whitehall House, S.W." "Tested, Phone, London." Regent 178.

## Aluminium Castings (Sand & Die)

Coan, R. W., 219, Goswell Road, London, E.C.1. "Frankases, Isling, London." City 846.

## Bearings (Etonia Cast Phosphor Bronze)—

Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds." Central 3927.

## Brass Sheets for Tipping Propellers—

Pritt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fen, London." Avenue 995, 996, and 7006.

## Buildings—

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

Palmer, T. W., & Co., Church Road, Merton Abbey, Surrey. "Wimbledon 1313."

Russey Owen & Co., Darlaston, South Staffs. The Wilfley Co., Ltd., Salisbury House, London Wall, E.C.2. "Wrathless, Phone, London." City 267.

## Cable Coverings and Cable Controls—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Capstan Work—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Carburettors—

Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.1. Victoria 4670.

## Casein—

Nieuwhof, Surie & Co., Ltd., 5, Lloyds Avenue, London, E.C.3. "Surico don, Fen London." Avenue 34 and 35.

## Castings—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Castings (Aluminium, Brass, Bronze, Machined or Rough)—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Celluloid (Non-Flam.)—

Greenhill & Sons, 8, Water Lane, E.C. "Greenberg, London." Central 1306-7.

London Label Co., Beckton Road, E.16. "Label, Canning, London." East 1300.

## Clothing—

Burberry's, Ltd., Haymarket, S.W.1. Regent 2165.

Dunhill's, Ltd., Euston Road, N.W.1. "Dunsend, London." North 3405-6.

## Component Parts—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines).

B. D. V. Aircraft Spares, Syon Chambers, 16a, Kew Road, Richmond, Surrey. "Aeros, Richmond." Richmond 1681.

Central Aircraft Co., Palmerston Works, High Rd., Kilburn, N.W.6. Hampstead, 4728.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

The Aircraft Construction Co., Harley Works, Beckton Road, E.16. "Aeracracons, Canning, London." East 1300.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

## Cords, Tapes, and Threads—

MacLennan, J., & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.

## Dopes—

British Aeroplane Varnish Co., Ltd., 166, Piccadilly, W.1. "Tetrafree, Piccy, London." Gerrard 2312.

British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellutate, London." Regent 4046.

The British Emallite Co., Ltd., 30, Regent Street, S.W.1. "Ridleyren, Piccy, London." Gerrard 280.

Cellon, Ltd., Broad Street House, New Broad Street, E.C.2. "Ajawb, London." London Wall 5359-3622.

Clark, Robert, Ingham & Co., Ltd., Walter House, Bedford Street, Strand, W.C. "Pearline, Westrand." Regent 3923.

## Electrical Accessories—

Belling & Co., Derby Road Works, Montague Road, Upper Edmonton, N.18. "Belling, Edmonton." Tottenham 1984.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207, London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Eus-road, London." Museum 70.

Premier Electric Heaters, Ltd., 258, 259, and 360, Bradford Street, Birmingham. "Fahrenheit, Birmingham." Midland 081.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynallite, Phone, London." Willesden 2480.

## Electric Cables—

E. Kalker & Co., Coventry. "Kalker, Coventry." Coventry 24x.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207, London Wall 1564.

## Electric Lighting and Power—

E. Stanley Fardon, A.M.I.E.E., 67, Mosley Street, Manchester.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207, London Wall 1564.

## Engines and Parts—

Allen, W. H., Son & Co., Ltd., Queen's Engineering Works, Bedford. "Pump, Bedford." Bedford No. 1.

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

The Beatty School of Flying, Ltd., The Broadway, Cricklewood, N.W.2. Hampstead 3000.

Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London." Gerrard 238.

Dudbridge Iron Works, Ltd. (Salmson), 87, Victoria Street, London S.W.1. "Aero-flight, Vic, London." Vic 7026.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

Gordon Watney & Co., Ltd., Weybridge. "Mercedès, Weybridge." Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham. Richmond 1293.

Gwynnes, Ltd., Hammersmith Iron Works, Hammersmith, W. "Gwynne, Hammer-smith." Hammersmith 1919.

Napier & Son, D., Ltd., 14, New Burlington Street, London, W., and at Acton, W. "Nitriker, London." Gerrard 8226.

Robertson, J. H., & Co., 1, Albemarle Street, London, W.1. Regent 3006.

Rolls-Royce, Ltd., 14 and 15, Conduit St., W.1. "Rollhead, London." Gerrard 1654-5-6.

The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. Regent 1181.

Sturtevant, B. F., Co., Ltd., Hyde Park, Boston, U.S.A.

Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorfield, Wolverhampton." Wolverhampton 655.

The Gnome & Le Rhône Engine Co., Ltd., 47, Victoria Street, S.W. "Elevenfold, London." Walthamstow 408 (2 lines).

## Flare Lights—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

## Flexible Shafts—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Flying Schools—

Bournemouth Aviation Co., Ltd., Talbot Village, Bournemouth. "Etches, Winton." Bournemouth 1160.

Cambridge School of Flying and Aerodrome Co., 108, St. Andrews St., Cambridge. "Carbon, Cambridge." Cambridge 5 and 1086.

## Furniture (Office)—

Cooke's (Finsbury), Ltd., Finsbury Pavement House, London, E.C.2. London Wall 573 and 6179.

## Galvanising—

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

The Rustless Iron (Cowper Coles Process), Ltd., 1, French St., Sunbury-on-Thames, Middlesex. Sunbury 37.

## Gears—

Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham." East 407.

## Glue—

Central Chemicals, Ltd., 283, West End Lane, London, N.W.6. "Entramical, Westham, London."

Improved Liquid Glues Co., Ltd., Gt. Hermitage Street, E. (Croid.). "Excroiden Wapp, London." Avenue 3178.

Mendine Co., 8, Arthur Street, E.C. Bank 5871.

Oldroad, Wm., & Sons, Ltd., 9, Mincing Lane, E.C.3.

## Goggles—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

## Heating and Ventilating—

Chas. P. Kinnell & Co., Ltd., 65 & 65a Southwark Street, London, S.E.1. "Kinnell, London." Hop 372 (2 lines).

## Hollow Spars—

McGruer Bentwood Hollow Spar Co., Commercial Wharf, Lamoeth, S.E. "Gabrielson, Watloo, London." Hop 718.

Robert Young's Construction Co., Ltd., Canonbury Works, Canonbury Street, Essex Rd., London, N.1.

## Instruments—

British Wright Co., Ltd., 33, Chancery Lane, W.C.2. Holborn 1308.

## Instruments (Scientific, Altimeters, etc.)—

The Cambridge Scientific Instrument Co., Ltd., Cambridge. "Instrument, Cambridge." Cambridge 642.

Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, Phone, London." Walthamstow 180.



# Buyers' Guide.



## Machine Tools—

Brewster & Co., 11, Queen Victoria Street, E.C.4. "Circumfuse, Cannon, London." City 768.

## Magneto Driving Pieces—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Magnetos—

The M-L Magneto Syndicate, Ltd., Victoria Works, Coventry. "Cortlon, Coventry." Coventry 1008-1009.

The British Lighting & Ignition Co., Ltd., 204, Tottenham Court Road, W.1. "Vicks-mag, Phone, London." Museum 430.

Eriasson Manufacturing Co. (Berling Magneto), Buffalo, N.Y., U.S.A.

## Metal Manufacturers—

Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 42-43.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

## Metals in General—

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Pritt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fen, London." Avenue 095, 096, and 7006.

Samuel Mercer & Co., 198, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

## Metal Parts and Fittings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

Aircraft Supplies Co., Ltd., Ascol House, 125, Long Acre, W.C.2. "Upcast, Rand, London." Gerrard 276 (2 lines).

A. J. & Harrison, Ltd., Hythe Road, Willesden Junction. Willesden 2297.

Bayliss, Jones & Bayliss, Ltd., Wolverhampton. (Bolts and Nuts.) "Bayliss, Wolverhampton." Wolverhampton 1041.

The Birmingham Guild, Ltd., 45, Gt. Charles Street, Birmingham. "Handicraft." Central 3705.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

The British Gold Shell Ring Co., Ltd., Inverness Road, Hounslow, London. "Golshel, Hounslow." Hounslow 254.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Eus-road, London." Museum 70.

Mountford, Fredk., Ltd., Fremo Works, Lifford, Birmingham. "Fremo, Birmingham." Kings Norton 261.

Robertson, J. H., & Co., 1, Albemarle Street, London, W.1. Regent 3996.

Rubery, Owen, & Co., Darlaston South Staffs. Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66.

The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulvupit, Phone, London." Holborn 410.

The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. Regent 1181.

The Aircraft Construction Co., Harley Works, Beckton Road, E.16. "Aeracracons, Canning, London." East 1300.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

Thompson Bros., Ltd., Bradley, Bilton. "Thompson Bros., Bilton." Bilton 10.

Wooler Engineering Co., Ltd., Old Oak Common Lane, Willesden Junction, N.W.10.

## Metal Shearing Tools—

Montgomery, Smith, & Co., Ltd., Tangent Works, Keynsham, near Bristol. "Ingenuity, Salford." Keynsham 21.

## Metal Spinnings—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Metric Bolts—

Cashmore Bros., Zota Works, Hildreth Street, Balham, S.W. Battersea 415.

Rubery Owen & Co., Darlaston, South Staffs.

## Miscellaneous—

Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast." Belfast 4033-4035.

Anti-Glare Glass Co., Ltd., 30, Wigmore Street, "Wingateise, London." Mayfair 2353.

Bowden Wire, Ltd., Willesden Junction, "Bowirelim, Harles, London." Willesden 2400 (3 lines).

British Metal (Kingston), Ltd., Kingston-on-Thames.

Brown Bros., Ltd., Great Eastern Street, E.C.1. "Imbrowned, Bethroad, London." London Wall 6300.

Herbert Frood Co., Ltd., Chapel-en-le-Frith, "Froolobake, Birmingham." Central 793.

Endolithic Manufacturing Co., Ltd., 613, Fore Street, London, E.C.2. Labels in Metal, Ivory, Ivoryine, etc.

Glasso Manufacturing Co., Ltd., 211, City Road, E.C. City 9558.

London Label Co., Ltd., Harley Works, Beckton Road, E.16. "Nonflamoid" Nonflammable Celluloid. "Lonlabel, Canning, London." East 1300.

MacLennan, J., & Co., 30, Newgate Street, E.C.1, and at Glasgow. Tapes, Cords and Threads. City 3115.

## Motor Cars—

Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

Mann, Egerton & Co., Ltd., 379/381, Euston Road, London, N.W.1. "Manegecar, Eus-road, London." Museum 70.

Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 530 (4 lines).

## Nameplates and Labels—

British Metal (Kingston), Ltd., Kingston-on-Thames.

Endolithic Manufacturing Co., Ltd., 613, Fore Street, London, E.C.2.

The Clegg Metal Engraving Co., Chatsworth Works, Worthing. "Clegg Worthing."

## Observation Panels—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

## Parachutes—

E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemaivo, Ave, London." London Wall 3266-3267.

## Pattern Making—

Fredk. Ward, 6, 7 and 8, Allsop Street, Upper Baker Street, W. Padd 4743.

## Piston Rings—

British Chuck & Piston Ring Co., Coventry. "Kings, Coventry." Coventry 723.

## Power Presses and Dies—

Bliss, E. W., & Co., 29, Pocock Street, Blackfriars Road, London, S.E.1. "Blissdon, London." Hop 4349.

## Presswork—

Rubery Owen & Co., Darlaston, South Staffs. Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Propellers—

Blackburn Aeroplanes & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames. "Ebora, Kingston." Kingston 672.

Integral Propeller Co., Ltd. "Avirop, Hyde, London." Hendon 9. Kingsbury 104.

Lång Propeller, Ltd., Weybridge. "Aerosticks, Weybridge." Weybridge 520-521.

Mann, Egerton & Co., Ltd., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Oddy, W. D., & Co., Leeds. "Aircscrews, Leeds." Central 291, Leeds.

Stanley Aviation Co., 67, Kingsland Road, E.2. City 8347.

Westland Aircraft Works, Yeovil. "Aircraft, Yeovil." Yeovil 129.

## Pyrometers—

The Foster Instrument Co., Letchworth, Herts. Foster Instruments, Letchworth, Letchworth 26.

## Rigging for Aircraft—

Craddock, Geo., & Co., Ltd., Wakefield, England. "Craddock, Wakefield." Wakefield 466 (3 lines).

## Rubber Tubing & Accessories—

Hancock, James Lyne, Ltd., 266, Goswell Road, London, E.C.1. "Masticator, Isling, London." City 3811 and 3812.

## Safety Belts—

Holmes, C. H., & Son, 38, Albert Street, Manchester. "Semloh, Manchester." City 4432.

## Screw-driving Machines—

Russell Bros. (Redditch), Ltd., Littleworth, Redditch. "Inventors, Redditch." Redditch 74.

## Seaplane Manufacturers—

Blackburn Aeroplanes & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

Mann, Egerton & Co., Ltd., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

The Norman Thompson Flight Co., Ltd., Mid-dieton, Bognor. "Soaring, Bognor." Bognor 48.

Short Bros., Rochester. "Seaplanes, Rochester." Chatham 627.

Supermarine Aviation Co., Ltd., Southampton. "Supermarine, Southampton." Southampton 1337.

## Searchlights and Landing

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibue, Phone, London." 3510 Victoria (3 lines).

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

## Seats for Aeroplanes—

Bowser, E., Art Cane Works, 50 Park Lane, Leeds. Central 3473.

## Shackles—

The British Gold Shell Ring Co., Ltd., Inverness Road, Hounslow. "Golshel, Hounslow." Hounslow 254.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

## Sheet Metal Pressings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

Blackburn Aeroplane and Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345.

W. H. Briscoe & Co., Ltd., 51 and 52, Park Street, Birmingham. "Brisk, Bham." Central 550.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

London Aluminium Co., Ltd., Westwood Road, Aston, Birmingham. East 497 Birmingham.

Rubery Owen & Co., Darlaston, South Staffs.

## Sheet Metal Work—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Rubery Owen & Co., Darlaston, South Staffs.

The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.

The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. Regent 1181.

Arthur Hill & Co., Silchester Road, North Kensington, W. Park 1443.

## Shock Absorbers (Elastic Cord)—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Sparking Plugs—

Lodge Sparking Plug Co., Ltd., Rugby. "Igniter, Rugby." Rugby 235.

Ripault, Loef & Co., Ltd. (Oleo Plugs), 64a, Poland Street, W.1. "Ripault, Reg, London." Gerrard 7758.

## Springs—

Dart Spring Co., West Bromwich. "Dart, West Bromwich." West Bromwich 322.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61 (3 lines).

## Stampings—

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

## Steel—

Firth, Thos., & Sons, Sheffield. "Firth, Sheffield." Sheffield 3230 to 3237.

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

Nicklin, Bernard, & Co., Birmingham. "Bernico, Birmingham." Smithwick 224.

## Steel Stamps and Markings—

John Meerloo & Sons, Cleveland Works, Cleveland Street, Mile End, E.1. "Dayhur, Phone, London." East 3331 (2 lines).

## Steel Tension Wires—

Craddock, Geo., & Co., Ltd., Wakefield, England. "Craddock, Wakefield." Wakefield 466.

## Steel Tubes for Aeroplanes—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

## Taper Pins—

Mountford, Fredk. (Birmingham), Ltd., Fremo Works, Lifford, Birmingham. "Fremo, Birmingham." King's Norton 261-262.

## Tapes and Smallwares—

Brown, Percy, & Co., 49, Newgate Street, London, E.C.1. "Ominate, Cent, London." City 4659.

MacLennan, John, & Co., 30, Newgate Street, E.C.1. and at Glasgow. City 3175.

James North Hardy & Son, Ltd., 54, Portland Street, Manchester. "Hardson, Manchester." Central 6471.

## Timber—

Engineering Timber Co., Ltd., 9, Victoria Street, London, S.W. "Entikosil, Vic, London." Victoria 5073, 4210.

Brown, R. F., & F. W., Wollaton Saw Mills, near Nottingham. "Brown's Saw Mills, Wollaton." Nottingham 1526.

J. Owen & Sons, Ltd., 109a, Borough High Street, S.E.1. "Bucheron, London." Hop 3811 (2 lines).

## BUYERS' GUIDE cont. on next page.







## The Aeroplane

## Buyers' Guide



## Acceptance and Experimental Flights

The Procter Isaac Aviation Co., "Aeromina, Pacey, London. Gerrard 378 (4 lines).

## Acetylene Welding Plant

Acetylene Corporation of Great Britain, Ltd., The 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic. London. Vic 4810. Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibac, Phone, London. 3540 Victoria (4 lines).

## Aeroplane Manufacturers

Aircraft Manufacturing Co., Ltd., Hendon. "Airmanship, Hyde, London."

Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle-on-Tyne. "Armstrong Aviation, Newcastle-on-Tyne." Gosforth 500.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851. British & Colonial Aeroplane Co., Ltd. (The Bristol Co.), Filton, Bristol. "Aviation, Bristol." Bristol 3906.

British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudron, Cricklewood, London." Hampstead 2334.

Central Aircraft Co., Palmerston Works, High Road, Kilmarnock, N.W.6. "Aviation, Kilmarnock." Kilmarnock 4903 and 4904.

Davidson Aviation Co., Ltd., Hammermill Lane, W.6. Hammermill 1441-1443.

Eastbourne Aviation Co., Ltd., Eastbourne. "Aircraft, Eastbourne." Eastbourne 1776.

Grubb-White Aviation Co., Ltd., London Aerodrome, Hendon. "Aviation, Hendon." Kingsbury 120.

Handley Page, Ltd., 110, Cricklewood Lane, N.W.2. "Hydrodip, Cricklewood, London." Hampstead 7210.

Hooper & Co., Ltd., 51, St. James St., Piccadilly, London, S.W. "Sociable, St. James, London." Regent 612.

Mann, Egerton & Co., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Martinsyde, Ltd., Brooklands, Byfleet. "Martinsyde, Weybridge." Woking 331; Byfleet 171.

National Aircraft Co., Ltd., 15, Hackney Road, N.E.2. "National Aircraft Co., Ltd." London Wall 6725.

"Nieuport" & General Aircraft Co., Cricklewood, London, N.W.2. "Nieuport, Cricklewood, London." Willenden 2453.

Norman-Thompson Flight Co., Ltd., Bognor. "Soothing, Bognor." Bognor 11.

The Regent Carriage Co., Ltd., 126/132, New King's Road, Fulham, S.W.6. "Carriages, London." Putney 2240-2241.

Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester." City 8330-8331, Manchester.

Saunders, S. E., Ltd., East Cotes, I.O.W. "Consuta, East Cotes." Cotes 193.

Shor, Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tested, Phone, London." Regent 378.

Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston." Kingston 744.

Standard Aircraft Manufacturing Co., Fillingham House, Arundel Street, W.C.2. "Gunsgrush, Extrad, London." City 89.

Vickers, Ltd., Imperial Court, Ball Street, King'sbridge, S.W.7. "Vickeria, Knights, London." Kensington 6810.

Waring & Gillow, Ltd., Hammermill, "Warren, Ox, London." Museum 5000.

Westland Aircraft Works, Yeovil. "Aircraft, Yeovil." Yeovil 100.

White, J. Samuel, & Co., Ltd., East Cotes. "White, East Cotes." Cotes 193.

Whitehead Aircraft (1917), Ltd., Richmond Surrey. "Whitehead, Richmond, Surrey." Richmond 1865.

Wycombe Aircraft Constructors, Ltd., High Wycombe, Bucks. "Aircraft, High Wycombe." High Wycombe 84.

## Airships

Airship, Ltd., High Street, Alerton. "Short Bros, Rochester, Eastchurch and Whitehall House, S.W." "Tested, Phone, London." Regent 378.

## Aluminium Castings (Sand &amp; Die)

Coan, R. W., 219, Goswell Road, London, E.C.1. "Krankas, Isling, London." City 746.

## Bearings (Etonia Cast Phosphor Bronze)

Yorkshire Engineering Supplies, Ltd., Wotley, Leeds. "Yea, Leeds." Wotley 1077.

## Brass Sheets for Tipping Propellers

Pitt & Co., 46, Fenchurch Street, London, E.C.3. "Pitt, London." Avenue 995, 996, and 996.

## Buildings

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

Palmer, T. W., & Co., Church Road, Merton Abbey, Surrey. "Wimbledon 1313.

Rusby Owen & Co., Darlaston, South Staffs. The Willey Co., Ltd., Salisbury House, London Wall, E.C.4. "Wraithless, Phone, London." City 247.

## Cable Coverings and Cable Controls

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Capstan Work

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Carburettors

Hobson, H. M., Ltd., 39, Vauxhall Bridge Road, S.W.1. "Victoria 4670.

## Casein

Nieuwhof, Surie & Co., Ltd., 5, Lloyd's Avenue, London, E.C.3. "Suridcon, Fen, London." Avenue 34 and 35.

## Castings (Aluminium, Brass, Bronze, Machined or Rough)

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Celluloid (Non-Flam.)

Greenhill & Sons, 8, Water Lane, E.C. "Greenberg, London." Central 1306-7.

London Label Co., Beeton Road, E.16. "London Label, Canning, London." East 1300.

## Clothing

Burberry's, Ltd., Haymarket, S.W.1. "Hampstead 7210.

Dunhill, Ltd., Euston Road, N.W.1. "Dunhill, London." North 3405-6.

## Component Parts

Acles & Pollock, Ltd., Oldbury, Birmingham. "Acles, Oldbury." Oldbury 111 (4 lines).

B. D. V. Aircraft Spares, Syon Chambers, 16, New Road, Richmond, Surrey. "Aeros, Richmond." Richmond 468.

Central Aircraft Co., Palmerston Works, High Rd., Kilmarnock, N.W.6. "Hampstead, 4728.

"Aviation, Phone, London." Willenden 2453.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Aviation, Birmingham." Central 731 (3 lines).

The Aircraft Construction Co., Harley Works, Beckton Road, E.16. "Aeracraes, Canning, London." East 190.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

## Cords, Tapes, and Threads

MacLennan, J., & Co., 30, Newgate Street, E.C.4. "And at Glasgow." City 3113.

## Dopes

British Aeroplane Varnish Co., Ltd., 166, Piccadilly, W.1. "Tetrafree, Piccy, London." Gerrard, 2312.

British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellulite, London." Regent 2947.

The British Emulsi Co., Ltd., 39, Regent Street, S.W.1. "Ridley, Piccy, London." Gerrard 280.

Cotton, Ltd., Broad Street House, New Broad Street, E.C.2. "Alpaw, London." London Wall 5350-5622.

Clark, Robert, Ingham & Co., Ltd., Walter House, Bedford Street, Strand, W.C. "Pearline, Westard." Regent 3923.

## Electrical Accessories

Belling & Co., Derby Road Works, Montague Road, Upper Edmonton, N.18. "Belling, Edmonton." Tottenham 1084.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Junn, London." Central 2127, London Wall 1364.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Euston Road, London." Museum 70.

Premier Electric Heaters, Ltd., 228, 230, and 300, Broad Street, Birmingham B.1. "Premier, Birmingham." Midland 681.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rotax, Phone, London." Willenden 2360.

## Electric Cables

E. Koller & Co., Coventry. "Koller, Coventry." Coventry 245.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Junn, London." Central 2127, London Wall 1364.

Electric Lighting and Power—E. Stanley, Farnham, A.M.I.E.E., 63, Mooley Street, Manchester.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Junn, London." Central 2127, London Wall 1364.

## Engines and Parts

Allen, W. H., Son & Co., Ltd., "Queen's Engineering Works, Bedford." "Pump, Bedford." Bedford No. 1.

Aerol-Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 18-18.

The Beauty School of Flying, Ltd., The Broadway, Cricklewood, N.W.2. "Hampstead 3044.

Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London." Gerrard 247.

Dudbridge Iron Works, Ltd. (Salmon), 33, Victoria Street, London S.W.1. "Aero, Night, Vic, London." Vic 7016.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 731 (3 lines).

Gordon Walney & Co., Ltd., Weybridge. "Mercedes, Weybridge." Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham. "Richmond 1109.

Gwynnes, Ltd., Hammermill Iron Works, Hammermill, W. "Gwynnes, Hammermill." Hammermill 1410.

Napier & Son, D. Ltd., 14, New Burlington Street, London, W.1. "Napier, London." Regent 4243.

Robertson, J. H., & Co., 1, Albemarle Street, London, W.1. "Robertson, London." Regent 3900.

Rolls-Royce, Ltd., 14 and 15, Conduit St., W.1. "Rolls-Royce, London." Gerrard 1644-45.

The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. "Selsdon, London." Regent 181.

Sturtevant, B. F., Co., Ltd., Hyde Park, Boston, U.S.A. "Sturtevant, Boston." Boston 100.

Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorsfield, Wolverhampton." Wolverhampton 985.

The Gnome & Le Rhone Engine Co., Ltd., 47, Victoria Street, S.W. "Gnome, London." Walthamstow 408 (4 lines).

## Flare Lights

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibac, Phone, London." 3540 Victoria (4 lines).

## Flexible Shafts

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Flying Schools

Burne-Croft Aviation Co., Ltd., Talbot Villa, Loughborough. "Eches, Woburn." Burne-Croft 1160.

Cambridge School of Flying and Aerodrome Co., Ltd., 12, New St., Cambridge. "Cambridge, Cambridge." Cambridge 5 and 1046.

## Furniture (Office)

Chas. P. Rinnell & Co., Ltd., 65, E. 5th Street, New York, N.Y. "Rinnell, New York." New York 100.

Galvanising—Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

The Kustler Iron (Copper) Co., Ltd., 1, French St., Sunbury-on-Thames, Middlesex. "Kustler, Sunbury." Sunbury 37.

## Gears

Most Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mogear, Birmingham." Aston 407.

Central Chemicals, Ltd., 283, West End Lane, London, N.W.6. "Entronical, Westhampton." London." Westhampton 100.

Improved Liquid Glues Co., Ltd., 61, Fernside Street, E. (Croyd). "Exerodion Wapp, London." Avenue 31.

Manning & Co., 8, Arthur Street, E.16. "Manning, Wm., & Sons, Ltd., 9, Mincing Lane, E.C.3.

## Goggles

Luxon Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterless, Piccy, London." Regent 1305.

## Heating and Ventilating

Chas. P. Rinnell & Co., Ltd., 65, E. 5th Street, New York, N.Y. "Rinnell, New York." New York 100.

## Hollow Spars

McGruer Bentwood Hollow Spar Co., 100, Oxford Street, London, W.1. "Gabriel, London." W.1. "Gabriel, London." W.1.

Robert Young's Construction Co., Ltd., Canonbury Works, Canonbury Street, Essex Rd., London, N.1. "Robert Young, Canonbury." Canonbury 100.

## Instruments

British Wright Co., Ltd., 33, Chancery Lane, W.C.2. "Wright, London." Holborn 1308.

## Instruments (Scientific, Altimeters, etc.)

The Cambridge Scientific Instrument Co., Ltd., "Cambridge, Instrument, Cambridge." Cambridge 647.

Shurt & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Walthamstow 180.

Shurt & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Walthamstow 180.

## Machine Tools

Brewster & Co., 11, Queen Victoria Street, E.C.4. "Circumfuses, Cannon, London." City 768.

## Magneto Driving Pieces

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Magnets

The M.I. Magneto Syndicate, Ltd., Victoria Works, Coventry. "Coventry 1000-1009.

The British Lighting & Ignition Co., Ltd., 204, Tottenham Court Road, W.1. "Vicks, Tottenham Court Road, W.1." Tottenham Court Road, London, W.1. "Museum 70.

Standard Motor Car Co., Coventry. "Rivychel, Coventry." Coventry 530 (4 lines).

## Metal Manufacturers

Chubb, Chas., & Sons, Ltd., Birmingham. "Chubb, Birmingham." Central 4243.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 731 (3 lines).

Metals in General—Gunn, J. B., & Son, 30, St. Mary Axe, E.C.3. "Gunn, London." Regent 1305.

Samuel Mercer & Co., 108, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

## Metal Parts and Fittings

A. L. & P. H. Co., Ltd., Oldbury, Birmingham. "Acles, Oldbury." Oldbury 111 (4 lines).

Aircraft Supplies Co., Ltd., Ascol House, Long Acre, W.C.2. "Upstart, Rand, London." Gerrard 276 (4 lines).

Anders & Harrison, Ltd., Hyde Road, Willesden Junction. "Wilkes, Willesden." Willesden 2367.

Bates, Jones & Bayliss, Ltd., Wolverhampton. "Bates, Wolverhampton." Wolverhampton 1041.

The Birmingham Guild, Ltd., 43, Elgin Street, Birmingham. "Handicraft." Central 3705.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

The British Gold Shell Ring Co., Ltd., Inverness Road, Hounslow, London. "Goldshell, Hounslow." Hounslow 254.

British Metal (Kingsland), Ltd., Kingston-on-Thames. "Kingsland, Kingston." Kingston 100.

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. "Guthrie, London." Regent 1305.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Euston Road, London." Museum 70.

McLennan, John, & Co., 30, Newgate Street, E.C.4. "And at Glasgow." City 3113.

Robert Young's Construction Co., Ltd., Canonbury Works, Canonbury Street, Essex Rd., London, N.1. "Robert Young, Canonbury." Canonbury 100.

The Palace Engineering Co., Ltd., 10, 16, 16, Pine Street, High Holborn, Central W.C.2. "Palatiput, Phone, London." Holborn 410.

The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. "Selsdon, London." Regent 181.

The Motor Construction Co., 11, White Horse Road, E.16. "Aeracraes, Canning, London." East 190.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rotax, Phone, London." Willenden 2360.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

Endolite Manufacturing Co., Ltd., 614, Fore Street, London, E.C.2. Labels in Metal, Ivory, Ivorian, etc.

Glasson Manufacturing Co., Ltd., 211, City Road, E.C.2. "City 9588.

London Label Co., Ltd., Harley Works, Beckton Road, E.16. "Nonflammable, Canning, London." East 1300.

MacLennan, John, & Co., 30, Newgate Street, E.C.4. "And at Glasgow." City 3113.

Motor Cars

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 18-18.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Euston Road, London." Museum 70.

Standard Motor Car Co., Coventry. "Rivychel, Coventry." Coventry 530 (4 lines).

Nameplates and Labels



**"The Aeroplane" Buyers' Guide.—continued.****Time Recorders—**

Gledhill-Brook Time Recorders, Ltd., 26, Victoria Street, S.W.1.      Victoria 1310.

**Turnbuckles—**

Rubery Owen & Co., Darlaston, South Staffs.

**Tyres and Wheels—**

The Palmer Tyre, Ltd., Shaftesbury Avenue. "Tyricord, Westcent." Gerrard 1214 (5 lines)

**Undercarriages—**

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

**Varnishes—**

The British Emailite Co., Ltd., 30, Regent Street, S.W.1. "Ridleyphen, Piccy, London." Gerrard 280.  
 Clark, R. Ingham & Co., Walter House, Bedford Street, Strand, W.C. "Pearline, Westrand." Regent 3923.  
 Harland, W. & Son, Merton, London, S.W.19. "Harland, Wimbledon 45." Wimbledon 45 and 1395.  
 Naylor Bros., Ltd., Southall, Middlesex. "Naylor, Southall." Southall 30.

**Vices—**

C. and J. Hampton, Ltd., Sheffield. "Vices, Attercliffe 95."

**Washers—**

Avenue 1412.  
 Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3.  
 Herbert Terry & Sons, Ltd. Redditch. "Springs, Redditch." Redditch 61.

**Watchmakers and Jewellers (Silver Models)—**

Goldsmiths' & Silversmiths' Co., Ltd., 112, Regent Street, W.1. Gerrard 0091 (3 lines).

**Welding and Cutting Plant—**

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.  
 Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

**Welding Repairs—**

Barimar, Ltd., 10, Poland Street, W.1. "Bariquamar, Reg, London." Gerrard 8173.  
 The New Welding Co., 26, Rosebery Avenue, London, E.C.1. "Windoneeda, Holb, London." Holborn 5252.  
 Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

**Wind Shields—**

Auster, Ltd., 133, Long Acre, W.C. "Winreflector, London." Regent 5910.  
 London Label Co., Ltd., Hadley Works, Beckton Road, E.16. "Nonflamoid" Nonflammable Celluloid. "Lowlabel, Canning, East 1300."

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

**Wire Gauze—**

N. Greening & Sons, Ltd., 16, Finsbury St., London, E.C.2. "Setscrew, Finsquare, London." London Wall 1082.  
 Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

**Wires and Cables (Aeroplanes)—**

Bruntons, Musselburgh, Scotland. "Wiremill, Musselburgh." Musselburgh 28.  
 Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466 (3 lines).

**Wirework—**

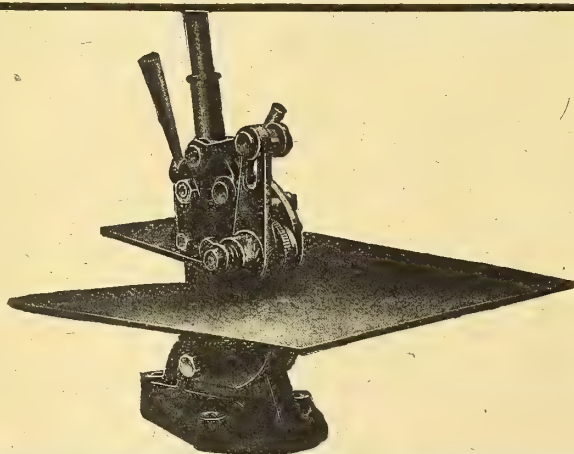
Terry Herbert & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

**Wood Refuse Suction Gas Producers—**

Ruston Proctor & Co., Ltd., Lincoln, England. "Ruston, Lincoln." Lincoln 580.

**Woodworking Machinery—**

Robinson, Thomas, & Son, Ltd., Railway Works, Rochdale. "Robinson, Rochdale." Rochdale 467.  
 Sagar, J., & Co., Ltd., Halifax. "Sawtooth, Halifax." Halifax 136.  
 Wadkin & Co., Leicester. "Woodworker, Leicester." Leicester 3614.

**'TANGENT'**

HAND  
 SHEET SHEARING MACHINE  
 PATENT.

SELF-FEEDING, FAST CUTTING.

STEEL, 3/16      SOFTER METAL, 1/4."

Write for Descriptive Pamphlet and Prices.

MONTGOMERY, SMITH & Co., Ltd.,

PATENTEES AND MANUFACTURERS,

TANGENT WORKS, KEYNSHAM, SOMERSET.

# HANDLEY PAGE LTD.

CONTRACTORS TO  
 THE ADMIRALTY  
 AND WAR OFFICE

CRICKLEWOOD,  
 LONDON, N.W.2.

HAMPSTEAD 7500 (9 lines).

"HYDROPHID, CRICKLE," LONDON



Contractors to the Admiralty and Air Board.



THE  
**CENTRAL AIRCRAFT COMPANY**

DESIGNERS AND CONSTRUCTORS  
OF AIRCRAFT.

Office and Works:

**KILBURN, N.W.6.**

Telegrams: Aviduction, Phone, London.

Telephone: Hampstead 4403, 4404.

**Non-Flammable Celluloid**


Phone Central 1306 & 1307  
Telegrams "GREENBERG" LONDON

**GREENHILL & SONS**  
8 WATER-LANE LUDGATE-HILL  
LONDON. E.C. 4



# "AERO" YARNS FOR AIRCRAFT FABRIC



 We have the longest experience in the trade in spinning Special Supertine Combed Yarns for manufacturers of Aircraft Fabric. We do not belong to any ring or combine. 263,000 Spindles.

## NIEUPOORT

AND

### GENERAL AIRCRAFT COMPANY, L<sup>TD</sup>.

CONTRACTORS TO H.M. GOVERNMENT.

OFFICE AND WORKS—  
LANGTON ROAD,  
CRICKLEWOOD, LONDON, N.W.2

TELEPHONE (3 LINES)—  
WILLESDEN 2455

TELEGRAMS—  
NIEUSCOUT, CRICKLE, LONDON



Contractors to H.M. Government.

Telegrams:  
CARBODIS  
LONDON.

THE  
**REGENT**

CARRIAGE Co. LTD.

Telephones:  
PUTNEY  
2240-1.

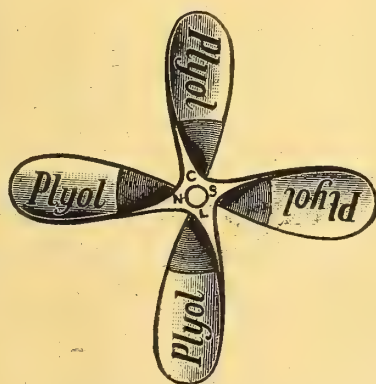
## AERONAUTICAL ENGINEERS

Designers, Manufacturers and Contractors,

126-132 NEW KINGS ROAD, FULHAM, LONDON, S.W.6.

**"PLYOL"**

THE  
BEST CEMENT  
FOR  
THREE-PLY,  
Veneering, etc.



Registered Trade Mark.

**ALDGATE CASEIN WORKS.**

NIEUWHOF, SURIE & Co., Ltd.

HEAD OFFICE

5, Lloyds Avenue, London, E.C. 3.

Works:

ALDGATE AVENUE, ALDGATE, E.C.

Also Casein especially adapted for  
Waterproof Paints, Varnish, etc.

Telephones  
AVENUE 34, 35.

Telegrams:  
'SURICODON, FEN LONDON.'

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



Telephones: DALSTON 872.

LONDON WALL 9766.

HAMPSTEAD 4768.

# Thames Aviation Works

(BURTON'S, LTD.)

**TWO COMPLETE MILL PLANTS AND TWO YEARS' EXPERIENCE.**

Addresses of our fine Saw Mills, Works, etc.,  
— have been camouflaged by the Censor. —

Offices only: 141, CURTAIN ROAD, E.C.

**CONSTRUCTORS OF COMPLETE AIRCRAFT**

And all kinds of WOOD PARTS, WINGS, AILERONS,  
— STRUTS, LEVERS, RUDDERS, NACELLES, &c. —

**Specialities—BIG STUFF and BEST WORK.****CONTRACTORS TO THE ADMIRALTY.**

Telegrams: "SUPERMARINE,"

'Phone: WOOLSTON 37.

ESTABLISHED 1912.

# The Supermarine

# Aviation Works Ltd

## Designers and constructors of Aircraft.

**FLYING WATER & SLIPWAYS:****WOOLSTON**

H SCOTT-PAINE, GENERAL MANAGER

**OFFICES & WORKS:****SOUTHAMPTON**

ENGLAND.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



The Hollow Structure and Aircraft Co., Ltd., Patent.

**WOOD PROBLEM SOLVED.**

# HOLLOW SPARS

And Struts for all types of machines.

**Any length, shape or section without joints.**

FULL PARTICULARS FROM THE SOLE LICENSEES,

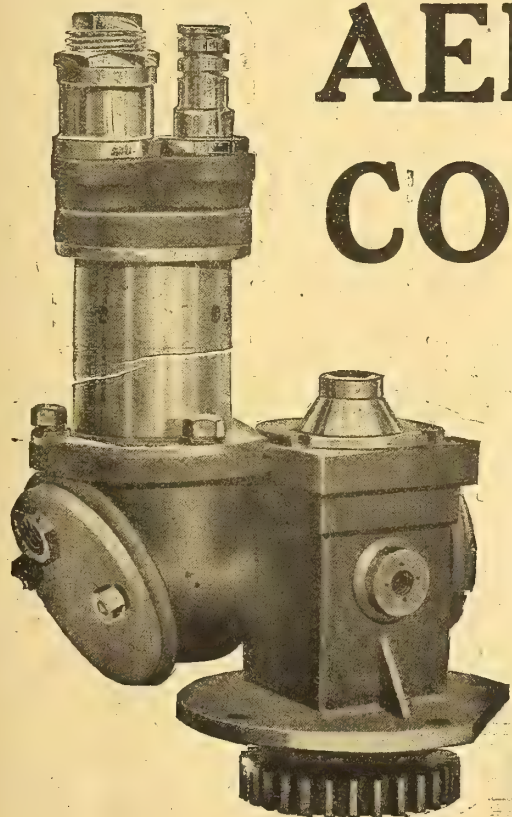
**ROBERT YOUNG'S CONSTRUCTION CO., LTD.,**

AIRCRAFT CONTRACTORS,

**CANONBURY WORKS, ESSEX ROAD, LONDON, N.**

TELEPHONE—  
DALSTON 2985.

TELEGRAMS—  
BYLDINCONT NORDO LONDON."



# AERO ENGINE COMPONENTS

MANUFACTURED BY THE

## SELSDON

**Aero and Engineering Co.  
Limited**

IMPERIAL HOUSE,  
KINGSWAY, W.C. 2.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# Firth's Best Cast Steel Files.

Apply for Copy of the  
New Official Price List.

**Thos. Firth & Sons, L<sup>d</sup>, Sheffield.**

# VICKERS LIMITED.

Contractors to the  
**WAR OFFICE AND ADMIRALTY.**

**Aviation Department, Imperial Court,  
Basil Street, Knightsbridge, S.W.8.**

Telephone No.—  
KENSINGTON 6810 (2 lines).



Telegraphic Address—  
VICKERFYTA, KNIGHTS, LONDON.



(Continued from page 650.)

possible. When we come to the ends all that is necessary is to shape them so that the bow will enter and the stern will leave the air without making eddies, which cause resistance. In a word, streamline them.

The fittings require some consideration as it is possible to add considerable weight to the float by badly designed articles. Each watertight compartment requires a light bronze drain plug in the bottom, which must be smooth on the outside, and a handhole plate in the deck directly over the drain plug, which opens from the inside. The handhole plate should be about four inches in diameter and be made of aluminium. While aluminium is quickly corroded by seawater, the process is retarded by boiling the fittings in linseed oil, so that they will last as long as the rest of the machine. A towing ring should be fastened in the bow and all edges which are apt to wear on the runways should be bound with thin sheet brass. The strut fittings by which the float is fastened to the fuselage of the plane are, of course, most important. They should be made of a high-grade bronze or of steel.

The outside lug that takes the strut end should have a solid fastening to the inside of the float and be carried down in such fashion that the bottom is supported both in compression (carrying the weight when the machine is on the water) and in tension (being carried by the struts when the machine is in the air). This can best be accomplished by means of solid bulkheads which can also be made watertight. One or two concerns have lately been experimenting with shock-absorber connections but with the use of the "V" bottom this would seem a refinement for sportsmen's use only.

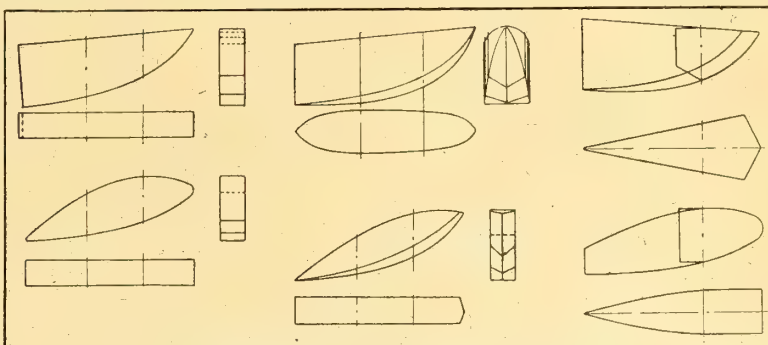
The accompanying sketches are intended to illustrate the foregoing remarks and to show the prevailing types of floats in present use. There have been many others, and there will doubtless be more of shapes yet undreamed, but so far as is now known it is unnecessary to go beyond those general types here shown.

Sketch No. 1 shows the simplest type of actually stepless pontoon. Most of its shape is in the profile as the top and bottom are flat surfaces brought together at the ends to provide proper streamlines. It is cheaply constructed due to its flat sections and for the same reason is fit only for experimental work. (Experimental with respect to the plane, not the float.)

Sketch No. 2 is the same thing improved for permanent work by the use of "V" bottom and a crowned deck to let the water off easily. Both of these floats are for use in connection with tail

floats as they are short and when hung in the plane so as to float in the position shown, they have almost no righting lever aft of the centre of gravity.

Sketch No. 3 is practically No. 2, with the addition of a tail to take care of the longitudinal stability when at rest. Note that the bottom of the tail slants upward and rearward from the step. This, as previously explained, is so that the tail will lift clear of the water and allow the plane to balance about its step.



8. Various Shapes for Tail and Wing-Tip Floats.

Sketch No. 4 shows an attempt to keep down spray by slanting the sides forward ("flaring" them as the naval architect would say). While quite widely used it is doubtful if the slight advantage gained is worth the considerable increase in cost.

Sketch No. 5 shows a British method of arriving at the same result. Note that they use a flat instead of a "V" bottom.

Sketch No. 6 shows a widely different type of float as developed by Lieutenant Holden R. Richardson, U.S.N. It represents the best American practice to-day. He has achieved both light weight and lessened skin friction for a given displacement by combining the top and sides in one semi-cylindrical surface. This as well as all the floats illustrated may be used either in one or two float systems.

Sketch No. 7 shows a typical flying boat hull for comparison.

Sketch No. 8 shows various wing and tail floats. The use of tail floats has been already explained. The wing floats are carried one under the end of each wing on flying boats or seaplanes, to throw the machine back to an even keel. In designing them due cognizance must be taken of the righting moment required so as to make them really work and yet not be larger than absolutely needed.

## THE PATENTS INDEX.

The subjoined list of recent inventions has been specially compiled by THE AEROPLANE from the current Official Patents Records.

### PATENT APPLICATIONS.

- Austin, J. Aero level indicator. No. 1720. Jan. 30th.  
 Barber, H. C. Devices for instruction of aeroplane gunners. No. 1643. Jan. 28th.  
 Birkett, R. W. Propellers for aerial and marine vessels. No. 1707. Jan. 29th.  
 Bygrave, L. C. Sights for use on aircraft. No. 1803. Jan. 31st.  
 Clements, J. Anti-aircraft, etc., guns. No. 1892. Feb. 1st.  
 Clerget, Blin & Cie. Cylinders of internal combustion engines. No. 1616. Jan. 28th.  
 Cobb, F. J. Level for aircraft, submarines, etc. No. 1912. Feb. 1st.  
 Davis, R. H. Dress for airmen. No. 1636. Jan. 28th.  
 Dean, A. J. Level indicator for aeroplanes, etc. No. 1962. Feb. 2nd.  
 Dickson, H. C. Tubes, struts, stays, etc., for aircraft. No. 1792. Jan. 31st.  
 Edwards, E. A. Indicating-appliance for aircraft. No. 1939. Feb. 2nd.  
 Ellis, G. Adjustable brace or stay for aircraft hangars, etc. No. 1673. Jan. 29th.  
 Fenn, A. G. Device for ascertaining inclination of aircraft, etc. No. 1624. Jan. 28th.  
 Fowler, H. Internal combustion engines for aircraft. No. 1625. Jan. 28th.  
 Heyst, F. A. van. Vertical velocity meter. No. 1614. Jan. 28th.  
 Johansson, C. A. Device for stabilization of aeroplanes. No. 1715. Jan. 29th.  
 Leitner, H. Aerial propeller. No. 1629. Jan. 28th.  
 Letord, E. Bracket seat for passengers on aerial navigation apparatus. No. 1829. Jan. 31st.  
 Lytton, E. Clinometers for aircraft. No. 1758. Jan. 30th.  
 Maina, J. Apparatus for storing bombs in aircraft and for releasing them. No. 1688. Jan. 29th.

- Marshall, J. E. Level indicators for aeroplanes, etc. No. 1820. Jan. 31st.  
 Marshall, J. E. Level indicators for aeroplanes, etc. No. 1821. Jan. 31st.  
 May, W. J. Aerial range-finder. No. 1824. Jan. 21st.  
 Murrish, J. Means for firing bombs, message-bearing parachutes, and ground or aerial flares. No. 1813. Jan. 31st.  
 Porter, J. R. Aeronautical machines. No. 1691. Jan. 29th.  
 Sanders, H. C. S. Electric bracket for dash-board lighting on aeroplanes. No. 1847. Feb. 1st.  
 Smith, H. Flying-machine. No. 1579. Jan. 28th.  
 Spencer, S. E. Apparatus for indicating inclination or direction of aeroplanes. No. 1789. Jan. 31st.  
 Taylor, W. Aircraft level indicator. No. 1662. Jan. 29th.  
 Urquhart, D. Dirigible airships. No. 1965. Jan. 29th.  
 Wimperis, H. E. Navigational devices for use on aircraft. No. 1711. Jan. 29th.

COMPLETE SPECIFICATIONS ACCEPTED, PRINTS OF WHICH CAN BE OBTAINED ON AND AFTER FEBRUARY 21ST, 1918.

112,806. Jan. 23rd, 1917. Little, J.R. Movable airship shed.

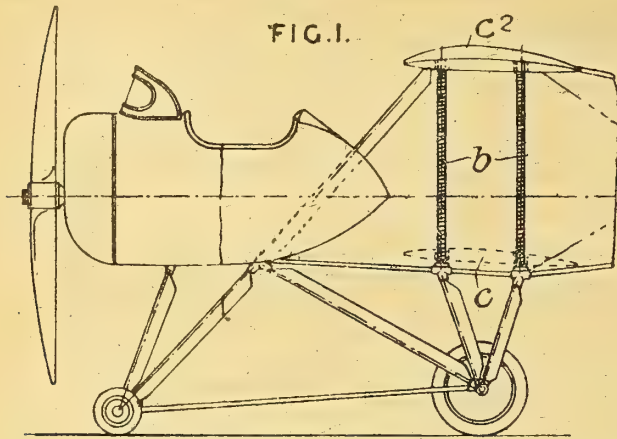
### ABRIDGMENTS OF RECENTLY PUBLISHED SPECIFICATIONS.

111,691. **Aeronautics.** HAMMOND, E. V., 88, Louisville Road, Balham, Surrey.

**STEERING AND BALANCING; PLANES, CONSTRUCTION AND ARRANGEMENT OF.**—Aeroplanes are provided with one or more collapsible planes adapted to be raised so as to close against the underside of the plane above, so as to vary the supporting area. Fig. 1 shows a biplane with a collapsible plane *c* adapted to be raised up to the upper plane *c*<sup>2</sup> or to be lowered therefrom by means of screwed struts *b*. The angle of incidence of the collapsible plane may be increased simultaneously with the lowering movement, by gearing adapted to rotate the rear screws *b* faster than the front ones. The incidence of the tail-plane also may be increased simultaneously with the lowering of the collapsible plane.

**STOPPING WAY.**—The incident of the collapsible planes may be increased sufficiently to render them serviceable as air brakes.

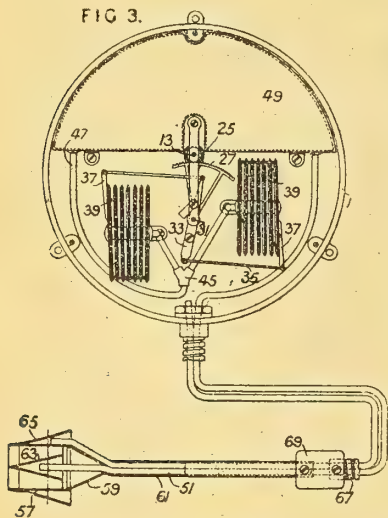




111,615. **Air-speed indicators.** JUSTICE, P. M., 55, Chancery Lane, London.—(Foxboro Co.; Foxboro, Massachusetts, U.S.A.).

Apparatus for measuring the speed of aircraft and vehicles through the air comprises a special form of Pitot-tube nozzle and a balanced arrangement of diaphragm-chamber pressure gauge.

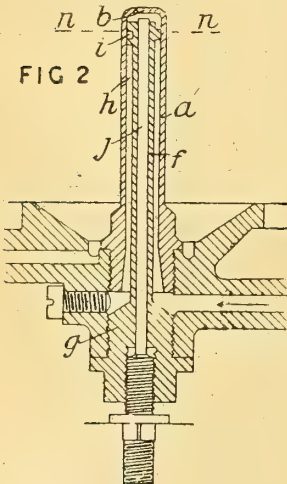
FIG. 3.



which a tube 47 leads, by way of a junction 45, to a symmetrically disposed pair of diaphragm chambers 39. The volume of the chambers 49 and 39 together is equal to that of the remaining space in the casing 1, in order to balance the static pressures. The outer ends of the chambers 39 have arms 37 connected by links 35 to a lever 33 mounted fast on a spindle 31 on which is fixed a rack 27 gearing with a pinion 25 on the index-spindle 13.

111,656. **Internal-combustion engines.** DUVERGER, L., 50, Rue Taitbout, Paris. Convention date, Nov. 11th, 1916. Not yet accepted. Abridged as open to inspection under Sect. 91 of the Act.

FIG. 2.



**CARBURETTING.** In carburetors, and particularly those for aeronautical engines, the fuel nozzle discharge orifice is controlled by a needle valve which extends axially through the nozzle, but is separated from the space through which the fuel flows to the orifice. The nozzle comprises an outer cylinder *a* and an inner cylinder *f*, the fuel flowing to the outlet orifice *b* through the annular space *h* and helical passages *i* between the cylinders. The orifice is controlled by the valve *j* which is screw-threaded into a plug *g* at the base of the cylinder *f*. The fuel level is shown at *n, n*. The valve may be removed without causing an escape of fuel, and, moreover, does not participate in closing the

fuel passage leading to the orifice *b*. As a modification, the needle-valve may be fixed and surrounded by an adjustable sleeve.

111,747. **Hydroaeroplanes.** WADE, H., III, Hatton Garden, London. (Wilkinson, E.; 2000, R Street, Washington, U.S.A.).

**FLOATS FOR AERIAL MACHINES.**—Relates to hydro-planes having a main central float, as *B*, and two smaller side floats *D, D1* secured abreast the rear portion of the main float. According to the invention, the side floats *D, D1* have their bottoms *d1*, Fig. 6, flared outwards, as shown. The floats are of streamline form, tapering forward and aft and with curved tops. The central float has a V-shaped bottom and a step which is vented through vertical tubes *B1*. The floats may be made of multiply wood with interposed layers of cloth and glue. The hulls are supported by diagonal bracing and stanchions and are subdivided into watertight compartments. The central float has a longitudinal bulkhead also. The bottoms of the side

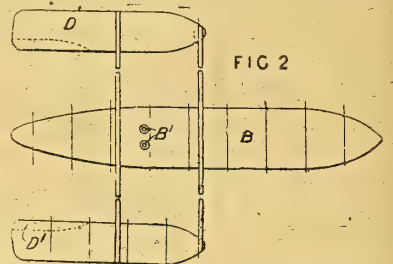


FIG. 2

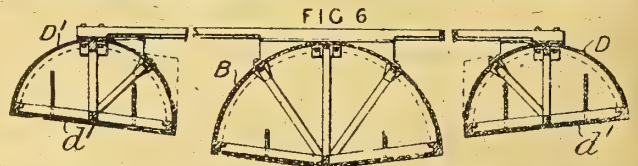


FIG. 6

floats are warped upwards towards the front. These floats are also disposed nearer to the centre of the wings than to the tips thereof so as to engage the water before the wing tips. The rear inboard edges of the side floats are made substantially vertical, as indicated by dotted lines; this shape prevents the flow of water over the decks of the float when the machine is turning on the water.

## ITALIAN AIRCRAFT INDUSTRY.

Capt. Luke Bongiovanni, about whom I frequently wrote in 1913 and afterwards, is being heard of especially in connection with a brilliant invention—a really satisfactory aero-elastic brake. He has already got a motor on the highway to the upper skies. Details of either the brake or the engine cannot be written about, so they are quite probably up to the Captain's own standard.

Of the 60,000 employés of the Ansaldo firm—which I see again mentioned in *THE AEROPLANE* of Nov. 28th—quite one half are engaged on aero work of one sort or another at Borzoli or elsewhere. The F.I.A.T. St. George engine works was quite an old business in pre-war times and so must not be confused with the Turin motor works, or the new S.I.A. factory there.

Talking of big things I hear that Sig. Lorenzo Santoni has another big combine on—nothing unusual for him of course.

Also that the Caproni triplane flew a wedding party of thirty from Langley Field to Glen Cove in U.S.A. piloted by Capt. Resnati of Milan. Three 8-cylinder Isotta Fraschinis powered the machine. Perhaps, that is to say.

I should never be surprised to hear that a well-known land-going machine of mastodontic size has been fitted with floats, a mere matter of fitting three or four Thames barges with relative bracing and springing, I suppose!

Comm. Gianni Caproni has been made an honorary member of the College of Civil Engineers; somewhat of an honour, indeed, for that august Society.

Cav. Anzani has also been made Grand Officer of the Crown of Italy, one of the higher honours available for commoners.

From 'planes via motors to stabilisers is an orderly sequence, and so should not the Sperry stabiliser (considered a good thing by many enlightened minds among designers here) be compulsory for night-flying avions?—T. S. H.

## BARIMAR ENTERPRISE.

In the current issue of "System" appears an interesting four-page article upon the re-creation of war-worn machinery, by Mr. C. W. Brett, Managing Director and General Manager of Barimar, Ltd. In this story of a new industry which the war has brought into prominence in Britain, Mr. Brett deals with the various processes brought into use for successful metal fusion, including oxy-acetylene, electric, and thermit welding, describing in detail the chief characteristics and uses of each. It is not without significance that Barimar, Ltd., have within the last few years been invited from three separate quarters to establish branches of their business in the United States, Italy and India.





# ARMSTRONG, WHITWORTH

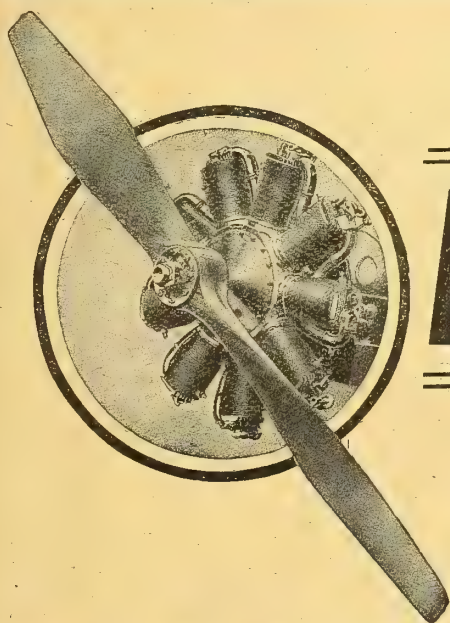
## AIRCRAFT WORKS,

### NEWCASTLE ~ UPON ~ TYNE.



TELEPHONE :- 500 GOSFORTH.

TELEGRAMS :- ARMSTRONG AVIATION,  
NEWCASTLE ~ ON ~ TYNE.



# AERO ENGINES



# W. H. ALLEN, SON & CO. L<sup>TD.</sup>

## QUEEN'S ENGINEERING WORKS, BEDFORD,

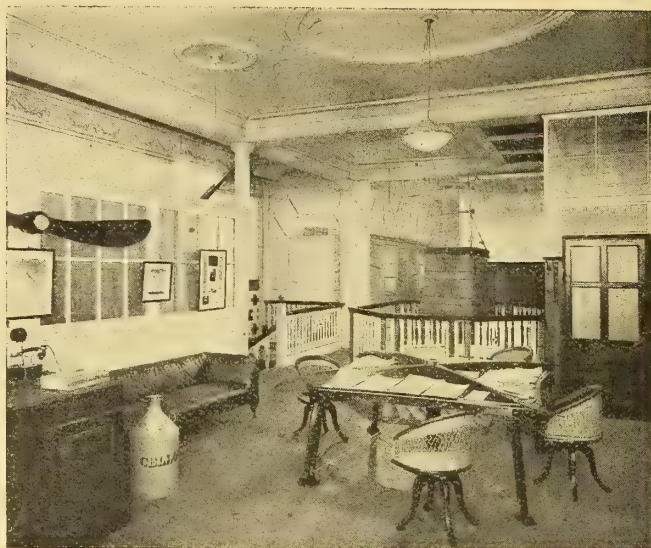
ENGLAND.



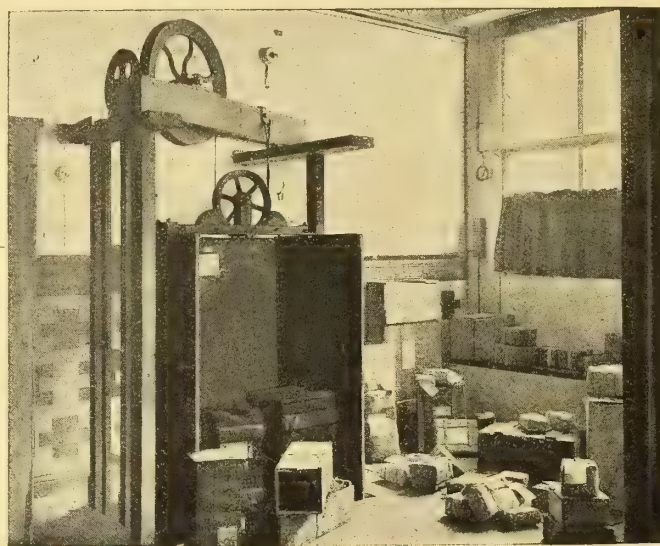


## ENQUIRE OF "ASCOL" SERVICE FOR THAT PART WHICH IS HOLDING UP YOUR WORKS.

**O**UR average weekly output is over 1,650,000 parts, and we can supply your requirements from a tiny screw to a complete unit. Aircraft Manufacturers interested are invited to visit our showrooms at "Ascol" House, Long Acre, where they will find displayed in orderly sequence the requisite parts for Aeroplane Construction. The whole of our organisation is at your disposal, and if we ourselves are unable at the moment to deliver the particular item from our own stocks we will be pleased to help you to get it elsewhere.



A corner of our Showrooms at "Ascol" House.



In transit from Warehouse.

### "Ascol" Reference Charts.

We have published several very useful Charts of A.G.S. and other Aircraft Parts which Aeroplane Manufacturers will find invaluable for reference purposes. These include A.G.S. Bolt and Nut Charts, Strainer, Equivalent Charts, etc. Copies mounted on card-board will be sent free on request.

### "Aircraft Supplies," Our Fortnightly House Journal

is published on alternate Thursday evenings, contains complete List of Stock of Aircraft Parts up to the time of going to press, Current Prices, Details of New Items, Enquiry Bureau, Charts and Tables of various parts and Short Articles of interest to Aircraft Manufacturers. It will pay you to receive copies regularly, and these will be sent free on application on official or business stationery.

G. H. Mansfield,  
Managing Director.

Works:  
Little James St.  
London, W.C. 1.

## THE AIRCRAFT SUPPLIES COMPANY LTD

Head Offices, Showrooms, and Stores:

ASCOL HOUSE, 125, LONG ACRE, LONDON, W.C. 2.  
CONTRACTORS TO THE AIR BOARD.

Representatives in Birmingham, Manchester,  
Scotland, South Coast



Leeds, Belfast, Northern Counties and  
the London District.

Telephone:  
Gerrard 276.  
Private Branch  
Exchange.

Telegrams:  
'Uccast, Rant,'  
London.



# THE AIRCRAFT TRADER

## MARKET TOPICS.

(Prices are for quantities on usual terms.)

Feb. 7th, 1918.

**COPPER.**—The American Copper output continues to improve and ample supplies are available for Government work. The statistics of the copper outputs of the different mines during 1917 have now been published and show that there has been a decrease of nearly 25,000 tons compared with 1916. The labour troubles were, of course, responsible for this decline.

Prices both here and in U.S.A. are, of course, under official control and there is very little possibility of a revision taking place.

**TIN.**—This market is in a very sensitive condition and there is no apparent possibility of the situation becoming any easier. During the past month prices have fluctuated between £309 and £266. Buyers are naturally very loth to book far ahead, and the fact that Eastern sellers are waiting for the prices to advance still further does not tend to relieve the situation.

The Tin imports into U.S.A. have been very small during the past few weeks and the position there is very serious. In fact it is reported that some works will not be able to carry on unless there is a radical improvement soon.

**LEAD.**—The position of lead is unchanged. Prices and supplies are under strict Government control.

**STEEL.**—There has been very little change in the general situation. Supplies are now very satisfactory. The trouble with the A.S.E. is being watched very keenly, especially in the Sheffield district, and it is generally felt that the question is not being handled discreetly and diplomatically.

Now that the output of the special steels required for aeroplanes has been brought to such a high level and is still on the increase, it would be a great pity if there was any cessation of production due to friction between the Ministry and the A.S.E. Supplies of Cast Steel are a little easier to obtain, but H.S. Steel is very scarce indeed.

**TIMBER.**—The question of Timber supplies is still in a very unsatisfactory condition, and there seems to be very little hope of averting what is bound to be a national calamity. This may sound rather pessimistical, but until the timber necessary to enable the aircraft factories to comply with the Air Council's output programme is actually in the country, there seems to be no ground whatever for optimism.

The position of 3-ply does not show the slightest improvement, and unless very drastic steps are taken the position will become simply deplorable. There has been a little improvement in Mahogany supplies.

There is plenty of English Ash available, but no dry wood can be procured.

**FABRIC.**—It is reported that steps are being taken to increase the available supplies of flax. This, of course, is the most important matter at the present time. It is also understood that there is a possibility of Cotton being used on certain portions of machines. There is no reason why this should not have been done long ago. In fact, immediately it was recognised that there was likely to be shortage of flax, steps should have been taken to conserve the stocks of Linen Fabric.

There has not been any official notification of the price of Fabric for 1918, although it is understood that this will be somewhere in the neighbourhood of 3s. 1d. per yard 36 in. wide, and 3s. 2½d. per yard, 38 in. wide.

## MONTHLY MARKET PRICE LIST.

Feb. 7th.

The prices given below are the prices ruling on the above date.

**TERMS.**—Usual for the various materials mentioned.

Prices of old metals are as quoted by scrap dealers.

Prices must not be taken as specific quotations for definite quantities delivered to any part of the country.

### ALUMINIUM.

Ingot ..... £225 per ton.\*  
Remelted ..... £210 per ton.\*

### BRASS.

Sheets ..... 15½d. per lb.

Strip ..... 14½d. per lb.  
Wire ..... 14½d. per lb.  
Tubes ..... 16d. per lb.  
Castings ..... 16d. per lb.  
Turning Rod ..... 14d. per lb.  
Brazen Tubes ..... 19½d. per lb.

### COPPER.

Ingot, Standard, Cash ..... £110 per ton.\*  
Ingot, Standard, 3 mos. ..... £110 per ton.\*  
Best Selected (net) ..... £123 to £119 per ton.\*  
Sheets ..... £147 per ton.  
Wire ..... 15½d. per lb.  
Tubes, S.D. .... 18½d. per lb.  
Tubes, Brazen ..... 18½d. per lb.  
Rivets ..... 1s. 10½d. per lb., basis.  
Tacks ..... 1s. 10d. per lb.

### FABRIC.

Linen, R.A.F., 17C, Spec., 36 in. wide, 2s. 8d. p. yd.\*  
Linen, R.A.F., 17C, Spec., 38 in. wide, 2s. 9½d. p. yd.\*  
Spaced, R.A.F., 17C, Spec., 37½ in. wide, 1s. 9d. p. yd.\*

### GUN METAL.

Castings ..... 1s. 8d. per lb.

### LEAD.\*

Virgin Pig ..... £29 per ton, c.i.f. net.  
Virgin Pig ..... £30 per ton, ex stores, net.  
Sheets ..... £39 10s. per ton, D/d., net.  
Pipes ..... £40 per ton, net.  
Dry White ..... £46 10s. per ton, less 5 per cent.  
White in Oil ..... £53 per ton.  
(lots over 5 cwt. less 5 per cent.)  
Red in Oil ..... £42 per ton, less 2½ per cent.  
(lots under 5 cwt. less 5 per cent.)  
Red in Oil ..... £42 per ton, less 2½ per cent.

### NICKEL.

Nickel ..... £230 per ton.

### PHOSPHOR BRONZE.

Ingots, 5 cwt. and under ..... £156 to £178 per ton.  
(Subject to Copper and Tin Fluctuations.)  
Castings ..... 1s. 7½d. to 1s. 10½d. per lb.

### PHOSPHOR COPPER.

Ton lots ..... £200 to £205 per ton.

### SILVER.

Silver ..... 43½d. per oz.

### SOLDER.

Plumber's ..... 128s.  
Tinman's ..... 170s.

### STEEL.

High Speed, 14 p. cent., Tungsten, 3s. 8d. per lb., basis.\*†  
High Speed, 18 p. cent., Tungsten, 4s. 5d. per lb., basis.

### ALLOY STEELS TO AIR BOARD SPECIFICATIONS.

#### Round and Square:—

Specification No. S2 ..... £86  
Specification No. S2 (bright-drawn) ..... £115  
Specification No. S8 ..... £86  
Specification No. S10 ..... £70  
Specification No. S12 ..... £75  
Specification No. S14 ..... £43  
Specification No. S15 ..... £70  
Specification No. S16 ..... £70  
Specification No. S17 ..... £75  
Specification No. S18 (oil-hardened) ..... £86  
Specification No. K1 ..... £75  
Specification No. K2 ..... £75  
Specification No. K3 ..... £86

The above prices are for ½ in. to 5/16 in. only, other sizes are proportionate.

### HEXAGONS.

..... 455 and 525 ..... 601 and 710.  
Specification S2 ..... £79 ..... £77  
Specification S8 ..... £79 ..... £77  
Specification S2 (bright-drawn), £112 ..... £112  
Specification S8 (bright-drawn), £112 ..... £112



SPELTER.	
English f.o.b., Birmingham .....	£54-£50
TIN.	
Tin .....	£299
TIN PLATES.	
Tinplate .....	30s., basis, f.o.t.*

TIMBER.†	
Official.	Merchants.
Silver Spruce, 10s. 4d. ....	18s. 6d. c.f.
English Ash .....	16s., c.f.
Cypress .....	10s. 4d. .... 15s. to 16s. 6d.
Mahogany, 1s. 10d. to 2s. ....	2s. 2d. to 2s. 6d., s.f.
Walnut, 2s. to 2s. 3d. ....	2s. 3d. to 2s. 6d. s.f.

ZINC.	
Zinc Sheets (American).....	£100, f.o.b., New York.

ALUMINIUM.	
Description.	Price per ton on sale to refiner, delivered at refinery.
Sheet cuttings and rods containing a minimum of 96 per cent. Al. ....	160 0 0
Old rolled, etc., containing a minimum of 96 per cent. Al. ....	120 0 0
Spinnings, punchings, and thin small scrap; also painted and varnished scrap that needs melting, containing a minimum of 96 per cent. Al. ....	105 0 0
Lump scrap from aero castings and material of equivalent value, containing 87 to 95 per cent. Al. ....	100 0 0
Turnings and Swarf, generally containing 87 to 95 per cent. Al. ....	87 10 0
Scrap, generally containing 80 to 86 per cent. Al. ....	80 0 0
Swarf and inferior Swarf, generally containing below 80—86 per cent. Al. ....	70 0 0
All Scrap, containing below 80 per cent. Al., not to exceed .....	65 0 0
All Swarf, containing below 80 per cent. Al., not to exceed .....	60 0 0

SCRAP MATERIALS (LONDON PRICES).	
Brass, Heavy Selected .....	£88
Copper, Clean .....	102
Copper, Brazery .....	82
Gun-metal, Scrap .....	120
Lead, no Draft .....	26
Zinc, Old .....	40

\*Official Prices.

†Includes Selection and Delivery.

‡Prices include Delivery in the U.K.

## A RAPID METAMORPHOSIS.

As mentioned in a recent issue of THE AEROPLANE, Mr. Keith-Davies, who may be regarded as one of the pioneer British pilots, since he holds Certificate No. 22, dated Oct. 11th, 1910, and who has been flying regularly ever since the earliest days, has taken charge of one of Shenstone & Co.'s factories and has converted it into an aircraft works.

Within a month of taking over the premises, Mr. Keith-Davies achieved the somewhat remarkable task of organising an entirely new staff, re-adapting the existing machinery to the new requirements, and starting production in quantities. He even made a respectable delivery of finished parts. How this was possible is more easily understood after an inspection of the system of production employed.

Great care is taken to keep the buying department thoroughly in touch with all production departments, so as to eliminate all delay. Much originality is displayed by the firm in the economical production of standard parts, and various machine-tools peculiar to such specialised factories have been adapted to uses of which their designers never dreamed.

Preparations are being made for a considerable extension of the existing premises, and building work has already reached an advanced stage. As the power employed is derived from producer gas, an electrical generating apparatus is being installed, and the works will be quite independent of outside assistance in the way of power, heating and lighting.

When the new premises are completed, it is the intention of the firm to produce complete aeroplanes built from parts made in the old works, and it is just possible that machines of original design may be constructed.

In the meantime, it is satisfactory to hear that the sub-contract work already completed has met with the highest approval, and the quality of the parts turned out are equal to, and possibly superior to, the standard patterns as regards finish and excellence of workmanship.

## A NOTABLE AWARD.

Sir William Beardmore has won this year's Bessemer Gold Medal, which is awarded "to the inventor or introducer of any important or remarkable invention either in the mechanical or chemical processes employed in the manufacture of iron or steel."

## A USEFUL REFERENCE BOOK.

Messrs. H. Rollet & Co., the well-known metal merchants of 34 and 36, Rosebery Avenue, London, have issued an extremely useful booklet showing the relative weights and thicknesses of different wires, sheets and rods.

The booklet includes in tabular form the following information:—

The thicknesses of wires in decimals of inches, and in millimetres to the Imperial Standard Wire Gauges from size 0 to size 50.

The thicknesses and weights per square foot of brass to the Birmingham Metal Gauge sizes 1 to 34.

The thicknesses of British Association Sizes in decimals of an inch and in millimetres, from 0 to 21.

Whitworth Hexagon Sizes, for standard nuts, showing diameter of nuts across the flats.

Weights per superficial foot of copper and brass sheets to Standard Wire Gauge No. 1 to 42.

Weights per lineal foot of round copper and brass rods from ½-inch to 5-inch.

Weights per 100 feet of copper and brass wire from No. 1 to 26 S.W.G., and, finally, weights per lineal foot of solid drawn brass tubes of different diameters and thicknesses.

All this information provided in a booklet which will go inside the average wallet should be of considerable value to aeronautical engineers, and the firm will be pleased to send a copy to any person engaged in the aircraft industry on receipt of the application enclosing postage stamp.

## A WELL-EARNED DECORATION.

As was announced in its proper place in the "London Gazette," Mr. Herbert Sykes has been awarded the Medal of the Order of the British Empire, for courage in testing aircraft in spite of severe accidents.

Mr. Sykes has for a considerable period been testing aeroplanes for the Whitehead Aircraft Co., Ltd., and some time ago he suffered injuries through an accident in landing which might very well have induced him to give up flying in favour of other work, but realising the need for test pilots at the present critical stage in the history of aircraft production, Mr. Sykes, with admirable determination, has continued his work as a pilot, and one sincerely hopes that in the future his flying will be marred no further by any such mischance.

At the same time it seems curious that so many other pilots, pioneers of aviation who flew for years before Mr. Sykes began to learn flying, and who risked their lives and narrowly escaped death many times during that period, should be passed over without notice.

## SAFETY WIND SCREENS.

Extract from a letter from Sec. Lt. —, R.F.C.

"I am sending you one of your safety glass wind screens which was fitted to a fighting machine. The machine fell into the roadway from a height of 300 ft. . . . If it had not been for the fact that the screen was 'Triplex,' the pilot would certainly have sustained serious injuries to his face and eyes. . . ."



A Portion of a Triplex Safety Glass Wind Screen which failed to splinter in a very bad crash.



# GWYNNES

LIMITED

CONTRACTORS TO H.M. ADMIRALTY AND WAR OFFICE.

SOLE LICENSEES AND MANUFACTURERS IN THE BRITISH EMPIRE  
OF THE

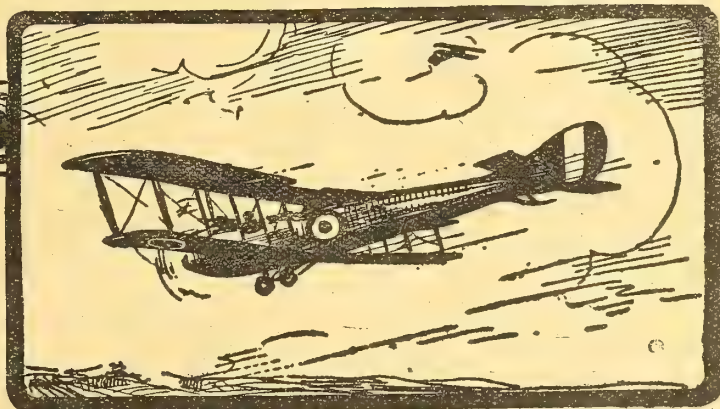
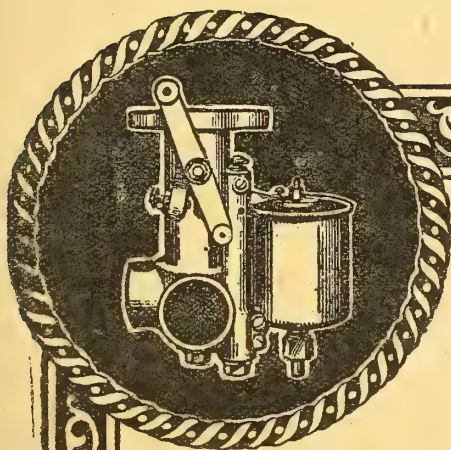
"CLERGET" PATENT AERO ENGINES.



WORKS & OFFICES: { CRISP ROAD, HAMMERSMITH, W.6. } LONDON.  
                                  { CHURCH WHARF, CHISWICK, W.4. }

TELEPHONES: 1910 HAMMERSMITH (3 lines).  
                  1780 CHISWICK 3 lines).

TELEGRAMS: "GWYNNE, LONDON."



## ZENITH

### CARBURETTER

Send for  
Illustrated Booklet. ZENITH CARBURETTER CO. LTD. 40-42 Newman St. LONDON, W.1.

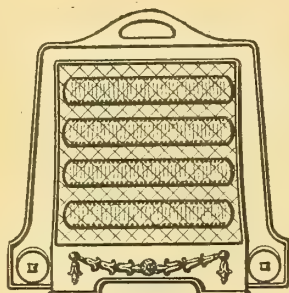
Where swiftness,  
efficiency, and reli-  
ability are needed  
in the Government  
Service—there you  
will find the  
Zenith Carburettor

TEL. 2500-7 4000



# BELLING ELECTRICAL ACCESSORIES

## AIRCRAFT Manufacturing Purposes.



### ELECTRIC FIRE.

OFFICE PATTERN. List No. 617.

An ideal fire for small offices, waiting rooms, passages, etc. We have also supplied a large number to Aerodromes for general heating. Numerous other designs are available.

PRICE 35/-

Dimensions—Height 17½ in., Width 17½ in., Depth 5½ in.



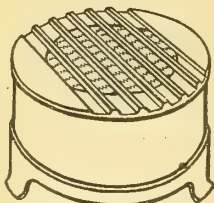
### ELECTRIC AIR WARMER.

List No. 960.

A reliable low temperature heating appliance, suitable for work rooms, etc. Can be used in any position without risk of fire.

PRICE 25/-

Dimensions—Length 15½ in., Width 6½ in., height 4½ in.



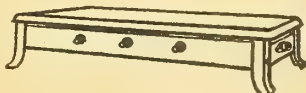
### ELECTRIC

### BOILING RING. (List No. 7.)

This will do all the same operations as an ordinary gas ring. Used for heating glue pots, and when loaded at 250 watts can be attached to any electric lampholder.

PRICE 15/-

Diameter 7 in.



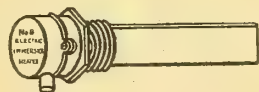
### ELECTRIC

### HOT PLATE. (List No. 18.)

Useful for keeping food warm, and also for drying purposes of all kinds.

PRICE 100/-

Size 36 in. by 18 in.



### ELECTRIC

### IMMERSION HEATER.

A reliable appliance for heating water, oil and other liquids. Can be easily fitted to existing tanks, etc.

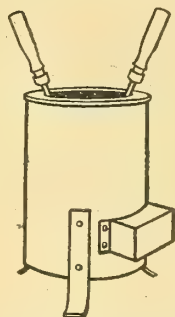
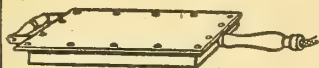
### ELECTRIC

### ENGINE WARMER.

For placing under engine in cold weather to prevent freezing. They are quite gas and fireproof.

PRICE 40/-

Size 12 in. by 7 in.



### ELECTRIC

### SOLDER POT. Type A.

This is the latest system for heating ordinary soldering irons, and consists of a pot of molten solder into which the irons are placed for a short time till heated.

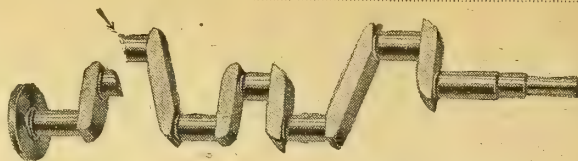
PRICE 65/-

Dimensions—Outside diam. 8 in., inner pan 5½ in. diam. at top, Depth 7 in.

All the above prices are subject to an advance of 25 per cent.

Our Catalogue illustrates many other special appliances we make for Manufacturing Purposes, Munition and Factory Work, Hospitals, Mess Rooms, etc.

**BELLING & CO.,** MANUFACTURING  
ELEC. ENGRS.,  
DERBY RD. WORKS, MONTAGUE RD., EDMONTON, LONDON, N. 18.



A heavy four-throw crankshaft broken across a 2½ in. journal. Repairs like this one are done in the Barimar Factory every day.

# BARIMAR Welds Crankshafts

UNDER

## "MONEY-BACK" GUARANTEE

THERE is no replacement more difficult to get to-day than a crankshaft.

Our customers tell us that spare crankshafts are as rare as golden sovereigns.

Barimar welds crankshafts by an Exclusive Welding Process—the only process that can make strong joints in heavy sections of carbon steel.

Thousands of crankshafts have been welded by Barimar, and no case of breakage under normal service conditions has been reported. Many Barimar-Welded crankshafts have been in use for years.

Barimar's Testing and Inspection Department has devised standard tests for crankshaft repairs, and the Safety Factor receives careful consideration.

Send your broken steel crankshafts, driving gear, machine tools, &c., to Barimar, and get the job done right and delivered quickly.

Our new Manual "B C" "The Welding Test" is now ready. The published price is 6d., but to those who have fractured metal parts to repair we shall be pleased to send copies post free. Please quote "B C" and mention "The Aeroplane."

## GET THAT REPAIR TO .. BARIMAR TO-DAY ..

Strip all fittings, attach label with your name and address, and, if weight permits, rush the repair to nearest passenger station. Please pay carriage if sent by goods rail. Advise by post, giving instructions and route.

Address all repairs to Dept. "B C."

# BARIMAR

LIMITED,

10, Poland Street, London, W. 1.

Telegrams:  
Bariguamar, Reg., London.

Telephone:  
Gerrard 8173



Crankshaft after welding and machining. This crankshaft has been in constant use for three years. In this case a Barimar Weld saved about £35.

KINDLY MENTION "THE AEROPLANE"

WHEN CORRESPONDING WITH ADVERTISERS.



# AIRCRAFT FINANCE

## CURRENT TOPICS. 14x58

### EMERGENCY LEGISLATION AND EXCESS PROFITS DUTY.

So much doubt appears to exist as to one's duty in regard to this much vexed question that there seems need of a statement as to how far a manufacturer or trader is liable on the point.

It is not only obligatory to make proper returns and to furnish accounts, but it is one's duty to give notice to the Commissioners of one's liability. The details of the Finance Acts sets out (*inter alia*):—

"The Commissioners of Inland Revenue have powers under the Finance Acts to require any person who may be liable to pay Excess Profits Duty to furnish them (within two months after the requirement for the return is made) with the returns of the profits of his trade or business during the accounting period or pre-war trade years."

Further, every person (or Company) chargeable to Excess Profits Duty is required to give notice to the Commissioners that he is so chargeable within two months after the termination of any accounting period in respect of which he is chargeable, or if the accounting period terminated before the passing of the Finance Act, 1916, within one month after the passing of that Act.

The penalty for failing to make any proper returns or to give any prescribed notices shall be a fine (on conviction) not exceeding £100 and a further fine not exceeding £10 a day for every day during which the offence continues after conviction therefor.

### AIRCRAFT COMPANY LITIGATION.

Reference has already been made in these columns in the issue of last week to an action at law in connection with the Cowper-Coles Aircraft Co., Ltd., and its Directors.

A further action was heard this week before Mr. Justice Neville in the Chancery Division of the High Court, and the following verbatim report is extracted from the "Times" Law Report of Feb. 2nd:—

The writ in the second action was issued on Jan. 30th by Sherard Osborn Cowper-Coles in the name of the company against the directors Taylor and King, and it claimed (*inter alia*):—

(1) A declaration that certain transfers of shares in the company made by the plaintiff Sherard Osborn Cowper-Coles to the defendants Taylor and King were obtained by the fraud of the defendant Taylor and were void.

(2) An injunction to restrain the same defendants from selling, mortgaging, or otherwise dealing with the said shares.

(3) An injunction to restrain the same defendants or either of them from dealing with or using the assets and funds of the company, and

(4) The appointment of a receiver and manager.

Mr. Ward Coldridge, K.C., and Mr. Lavington, for the plaintiffs in the second action, now moved for injunctions and a receiver in the terms of the writ.

Mr. Beebee (Mr. Jenkins, K.C., with him), for the defendants Taylor and King, and for the plaintiffs in the first action: Your Lordship granted on Jan. 25th an injunction restraining Mr. Sherard Osborn Cowper-Coles from acting as a director, but gave him leave to move to discharge the order on giving us two days' notice. He has not done so, nor, so far as we are aware, has he filed any evidence in our motion. Then on Wednesday the second action is commenced. I ask that our injunction may be continued for another week, and that their motion may stand for a week, so that we may have an opportunity of answering their affidavits.

Mr. Ward Coldridge: The delay in communicating with the other side has arisen through a change of solicitors. We have filed several affidavits, which contain serious allegations of fraud against Mr. Taylor, and I move *ex parte* for an injunction and receiver.

Mr. Justice Neville: To move *ex parte* for an injunction and receiver on allegations of fraud is a bold adventure.

Mr. Ward Coldridge: It is a matter of public importance having regard to the munitions contracts which the company is engaged upon.

Mr. Justice Neville: The Court does not appoint a receiver in an action by one shareholder against another in a company. If they cannot agree they must wind up the company.

Mr. Ward Coldridge: It is not desired to wind up the com-

pany, but on our evidence Taylor and King obtained their position as directors by fraud.

Mr. Beebee: I protest against *ex parte* allegations of fraud. Moreover, the defendant has no authority to use the name of the company as co-plaintiff in his action.

Mr. Justice Neville: This is not a case for granting *ex parte* an injunction or receiver on allegations of fraud. The motion must stand over for a week.

Mr. Beebee: Without prejudice, I will give an undertaking not to dispose of the shares, or deal with the assets except in due course for the business of the company.

Mr. Justice Neville: That is very proper, and, of course, casts no reflection whatever on the conduct of Mr. Taylor and Mr. King. I will continue the injunction in the first action for another week. I do not say which action is right, but the defendant ought to have given notice to the plaintiffs of the affidavits which he had filed, and his motion in this action will stand over for a week.

No comment at this stage is permissible, consequently for the present a record of the proceedings alone is given.

### AIR RAIDS AND STATE INSURANCE.

It has become such an extended practice to consider that every insurance policy carries the customary "days of grace" for the payment of the premiums that the decision recently recorded in a claim under Government insurance for damage by air-raid is one of grave importance to everyone holding such a policy.

A Metropolitan Police magistrate ruled that a claim was disqualified by reason of the fact that the renewal premium was a few days in arrear at the time of the damage. The insurer had relied upon the customary "days of grace" allowed by general insurance practice, and was non-suited in consequence. Holders of policies under State insurance will do well to note and act accordingly.

G. A.

### COMPANIES' ANNOUNCEMENTS.

#### NEW COMPANIES.

The files of the following new companies are available for inspection at Somerset House.

ACCUMULATORS (BIRMINGHAM) LTD. Private company. Registered Jan. 28th. Capital £5,000 in £1 shares. Manufacturers of and wholesale and retail dealers in accumulators for lighting and starting motors, motor cycles and cars, aeroplanes, airships, engines of all kinds, house lighting and other electrical plants, etc. The subscribers (each with one share) are:—

W. H. M. Burgess, 40, Glasshouse Street, W., merchant.

H. J. Prockter, The Gables, Lingfield, Surrey, architect.

Permanent directors:—W. H. M. Burgess and H. J. Prockter. Remuneration, £200 each per annum, free of income tax.

Registered office: 36-40, Glasshouse Street, Piccadilly Circus, W.1.

ALLIANCE AEROPLANE CO., LTD. (Supplementary particulars). Private company. Registered Jan. 26th. Capital £451,000 in £1 shares. (450,000 ordinary and 1,000 deferred). Manufacturers of and dealers in aeroplanes, airships, balloons, aerobuses and aircraft of every description, whether dirigible or otherwise, and all parts thereof and articles used in the manufacture, maintenance and working thereof, to construct, equip, repair and maintain aerodromes, hangars and sheds, to carry on business as aerial and general carriers of goods and passengers, and agents for carriers and others, to develop and promote the science and practice of and interest in aerial navigation, aviation, and aerial engineering, to demonstrate and teach aviation and aeronautics, etc.

The subscribers (each with one share) are:—

J. Ritson, 83, Lonsdale Road, Barnes, S.W.13, chartered secretary.

G. Barclay, 3, Chandos Avenue, Oakley Park, N., chartered accountant.

The ordinary shares confer the right to a fixed cumulative preferential dividend of 10 per cent. per annum and priority as to repayment of capital in a winding up, but no further right to participate in profits or assets. The first directors are to be appointed by the subscribers. No share qualification required. Remuneration as fixed by the Board, but not to exceed in any one year such sum as will, after payment of income tax on said remuneration, leave a net remuneration of £3,500 available.

No notice of situation of registered office filed with original papers.



**TUBES (EQUIPMENT), LTD.**—Private Company. Registered Feb. 5th. Capital £1,000 in £1 shares. Manufacturers of and dealers in metal tubes, cycles, motors, aeroplanes, aircraft and cycle and motor parts, electrical and general engineers, etc.

The subscribers (each with one share) are:—

J. H. Aston, Beech Hill, Wylde Green, manufacturer.

A. Chamberlain, 39, Augustus Road, Edgbaston, manufacturer.

The first directors are:—J. H. Aston, A. Chamberlain, G. Beesly, A. E. Kirk, and J. Rollason. Solicitors: Pinsent and Co., Birmingham.

**SIDNEY DAVIDSON BALLOON CO., LTD.**—Private Company. Registered Feb. 4th. Capital £4,000 in £1 shares. To take over the business of manufacturers of and dealers in balloons and lighter-than-air craft of all kinds and component parts therefor formerly carried on by S. Gluckstein, S. H. Gluckstein, W. E. Chester, and P. L. Mott, as the "Sidney Davidson Balloon Co.," at Lonsdale Road, West Kilburn.

The subscribers (each with one share) are:—

P. L. Mott, 6, Cornwall Terrace, Regent's Park, N.W.1, timber merchant.

W. E. Chester, Brathay, Park Road, Teddington, aircraft manufacturer.

S. Gluckstein, 46, Croxteth Road, Liverpool, caterer.

S. H. Gluckstein, 43, Upper Berkeley Street, W., building contractor.

The first directors are:—S. Gluckstein, S. H. Gluckstein, W. E. Chester, and P. L. Mott, each of whom may retain office while holding 250 ordinary shares. Registered Office: Lonsdale Road, West Kilburn, N.W.

**AIRCRAFT AND PRODUCTION AUXILIARY ASSOCIATION, LTD.**—Registered Feb. 5th, as a Company Limited by guarantee with 1,000 members each liable for £2 in the event of winding up. Objects: To establish, maintain, and conduct an association for assisting members in obtaining and carrying out Government and other contracts, to afford members all the usual advantages and centre of information and advice on the rights of, and all matters appertaining to those engaged or interested in the aircraft and allied industries, to provide and maintain a suitable organisation for maintaining, protecting and enforcing the rights of those engaged or interested, to carry on business as contractors, carriers, transport agents, electricians, engineers, wood workers and aircraft and component manufacturers and garage and hangar keepers, etc.

The subscribers are:—

A. J. Liversedge, 20, Essex Street, W.C.2, engineer.

B. Desbleds, 23, Flood Street, Chelsea, S.W., engineer.

J. Grun, 1, Inkerman Terrace, Allen Street, Kensington, W., organising secretary.

C. P. Fearnley, 50, Doughty Street, W.C., accountant.

C. W. Hannam-Harris, F.I.S.A., Fulwood House, Fulwood Place, W.C., incorporated secretary.

J. F. Green, 32, Upper Mall, Hammersmith, W.6, Chairman of Executive Committee of British Workers' League.

A. E. Harrison, 247, Cavendish Road, Balham, S.W., law clerk.

There is to be an Executive Committee of not more than 20 members exclusive of the secretary. The above subscribers are temporary directors. Solicitors: N. Hart, 9, Staple Inn, W.C.

**NORTHWOLD AIRCRAFT COMPANY, LTD.**—Private Company. Registered Jan. 17th. Capital, £3,000 in £1 shares. Manufacturers of and dealers in aeroplanes, parts, engines, munitions, etc. The subscribers (each with one share) are:—

F. A. Greaves, 43, The Ridgway, Chingford, manufacturer.

A. J. Lyons, 11, Baytree Road, Brixton Hill, S.W., traveller.

Permanent directors:—F. A. Greaves, A. J. Lyons, F. M. Davis, A. Thomas and S. J. Gliksten (all British). Solicitor: J. De Menza, 238, Bishopsgate, E.C.

## BUSINESS NAMES REGISTRATIONS.

**SIR J. H. BILES & SON.**—Registered Dec. 14th, 1917: Aircraft manufacturers. Hamworthy, Poole, Dorset.

Partners.—(1) Sir John H. Biles, Kt. (British), 6, Palace Court Chambers, W. (2) John H. Biles, junr. (British), 28, Park Drive, Hampstead, N.W.

## MORTGAGES AND CHARGES.

**RELIANCE ENGINEERING CO. (SHEEN) LTD.**—Registered Jan. 25th, 1918. Debenture, £512 10s. Secured by general charge.

**SIRON CARS, LTD., SOUTHALL.** Registered Jan. 25th, 1918. Debenture, £5,000. Secured by general charge.

## SATISFACTION.

**BRIGHTON-SHOUREHAM AERODROME, LTD.** (late Aviators Finance, Ltd.).—Satisfaction registered Jan. 29th, 1918, for £750 balance of £7,500 filed May 12th, 1911.

## MEETING OF CREDITORS.

**THE GLENDOWER MOTOR COMPANY (LTD.).**—NOTICE IS HEREBY GIVEN, that, pursuant to Section 188 of the Companies (Consolidation) Act, 1908, a MEETING of the CREDITORS of the above-named company will be held at the Offices of Messrs. Fletcher, Head, and Co., 65, London Wall, London, E.C., on Thursday, the 21st day of February, 1918, at three p.m.

ARTHUR SISSONS, Liquidator.

## ANSWERS TO CORRESPONDENTS.

*Enquiries on any subject relating to Investments, Stocks, Shares and Securities of aircraft or kindred companies will be answered in these columns, free of charge.*

*Letters should be accompanied with the names and address of the writer (solely as evidence of good faith) and the correspondent should adopt a "nom de plume" under which the reply will appear.*

"**FORMALITY.**"—It has been legally decided that the signature of a company official without adding the word "Limited" to the title of the company renders the signatory personally liable.

"**TAFFY.**"—In cases where a company is intended to carry on business in Wales the clause may be inserted as follows: "The Registered Office of the Company will be situate in Wales." As however Wales is considered to be part of England this variation is unnecessary.

"**PARTLY-PAID.**"—You may be sued by the liquidator for unpaid calls due before you transferred the shares. You became a debtor to the company and the liquidator is not bound to recognise the transferor.

"**RIGHTS.**"—A declaration that the profits are to be applied first in paying a dividend on the preference shares, gives the preference shareholders the right to cumulative dividends; but a declaration that a preferential dividend is to be paid "out of the net profits of each year" does not give the right to cumulative dividends.

G. A.

## THE CONTROL OF FLAX.

The Flax Control Board announce that an Order has been made by the Army Council under the Defence of the Realm Regulations prohibiting the delivery of line or tow yarn, produced wholly or partly from flax, for shipment from Ireland without the permit of the Flax Control Board; such permits will be issued by the Flax Control Board (Irish Sub-Committee), to whom application should be made at 31, Wellington Place, Belfast.

## U.S.A. AND PETROL PRODUCTION.

Cable advices from New York show that President Wilson is taking personal interest in steps to bring about petrol economy without undue disturbance of transport interest. He has agreed that every encouragement shall be given to the continued output of electric lorries, both for home trade and export to the United Kingdom.

## CURRENT SHARE QUOTATIONS.

Aircraft Mfg. Co. 7½% cum. pref. £1 ...	23- 24/-	General Electric 6½% cum. pref. £10 ...	10½ 10½	Triplex Safety Glass, £1 ordinary ...	24- 25/-
7½% cum. & ptg. "B" ...	22/- 23/-	Co., Ltd. £10 ordinary ...	19½ 20	Vickers, Ltd., 5% pref. stock ...	78 82½
pref., (fully paid) ...	31 3½	Gwynnes, Ltd., 5% cum. pref. ...	5½ 6	5% pref. shares. £1 ...	17½ 18-
Armstrong (Sir W. G.) Whitworth & Co., Ltd. 5% 2nd. pref. £1 ...	17- 18-	Ordinary ...	35- 36-	£1 ordinary ...	41- 42-
£1 ordinary ...	41- 42-	Greenwood & Batley, Ltd., £10 ordinary ...	9½ 10	Wm. Beardmore & Co., Ltd., 6% c. pf. £1 ...	19- 20-
Austin Motor Co., Ltd. 7% cum. pref. £1 ...	18- 19-	Humber, Ltd., 6% cum. pref. £1 ...	15- 15½		
£1 ordinary ...	24- 25-	£1 ordinary ...	22- 22½		
Birmingham Small Arms Co., Ltd. £1 ordinary ...	59- 60-	Napier (D) & Son, Ltd., 7½% cum. pf. £1 ...	18- 19- x		
5% cum. "A" pref. ...	4½ 4½	Peter Hooker, Ltd., £1 7½% cum. partic. 1st pref. ...	19- 20-		
6% cum. "B" pref. ...	20- 21-	Rolls Royce, Ltd., £1 ordinary ...	67- 68-		
Boulton & Paul, Ltd., 5% cum. pref. £1 ...	3 3½	Rudge Whitworth, Ltd., £1 ordinary ...	45- 46-		
Brown Bros., Ltd., 6% cum. pref. £5 ...	4½ 4½	Ruston, Proctor & Co., Ltd., £1 ordinary ...	28- 29-		
Darracq (A) & Co., £1 ordinary ...	84- 85-	& Co., Ltd., 5% cum. pref. £1 ...	16- 17- x		
(1905) Ltd. 7% cum. pref. £1 ...	22- 23- x	Sunbeam Motor Car Co., Ltd., £1 ord. ...	80- 81-		
Electric Construction Co., Ltd. 7% cum. pref. £1 ...	21- 22-	Straker Squire, Ltd. (1913), £1 ordinary ...	22- 23-		
Fellows Magneto Co., 8% cum. partip. pref. ...	16- 17-	S. Smith & Son, Ltd. (Motor Accessories) £1 ordinary ...	27- 28-		

February 12, 1918

x—ex dividend

Owing to the difficulty of estimating liabilities under Finance and Munitions Acts, the accounts will not be ready until a later date.



# SAFETY 'TRIPLEX'

## Safety Behind 'Triplex'

— THE ONLY UNSPLINTERABLE GLASS. —  
 SUCCESSFULLY USED FOR GOGGLES,  
 AEROPLANE AND AUTOMOBILE WINDSCREENS,  
 WINDOWS, etc. Catalogue Mailed on Request.

The 'Triplex' Safety Glass Co., Ltd.

REGINALD DELPECH (Managing Director).

1, ALBEMARLE STREET, PICCADILLY, LONDON, W.1.

CONTRACTORS TO H.M. GOVERNMENT.

*H. & O., Ltd.*

*Harris & Others, Limited,*

**AIRCRAFT CONSTRUCTORS,**

*Old Town, Clapham, S.W.4.*

**WOODWORK, METALS, COVERING AND DOPING.**

Phone: Battersea { 1238  
1047

**Sub-Contractors to leading Aeroplane Builders.**

**On Admiralty and War Office Lists.**



**"Always at  
the Front!"**

**BLACKBURN Propellers  
and Metal Fittings**

The  
BLACKBURN  
AEROPLANE  
and MOTOR  
CO. LTD.  
LEEDS  
and  
HULL.

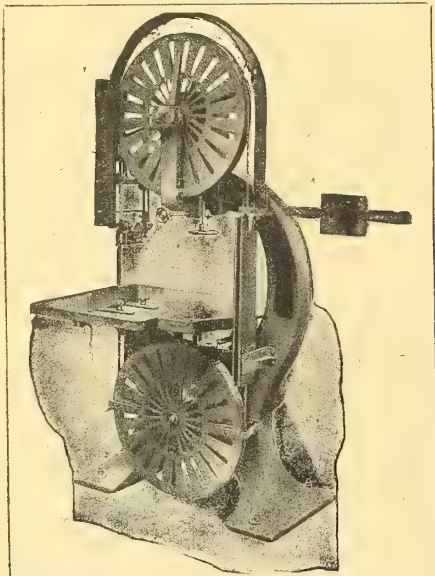
Contractors to the  
ADMIRALTY  
and  
WAR OFFICE.

**Blackburn**  
**AIRCRAFT**

**HAIGHS**

**(OLDHAM) LIMITED**

MANUFACTURERS OF ALL TYPES OF WOOD WORKING MACHINERY.



**C.K.S. Type High Speed  
Band Sawing Machine**

**Built in Three Sizes with Saw Pulleys.**

26 inches, 30 inches, and 36 inches diameter.

**Globe Iron Works, Oldham.**

*Early delivery can be given.*

Telegrams: HAIGH, OLDHAM.  
Telephone: 1273 Oldham.



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





# NAVAL *and* MILITARY AERONAUTICS



## FROM THE "LONDON GAZETTE."

ADMIRALTY, Feb. 4th.

R.N.A.S.—Temp. Flt. Lts. to be temp. Flt. Comdrs.:—C. R. Carr, W. Huggan, Feb. 1st. Temp. Flt. Sub-Lt. to be temp. Flt. Lt.:—H. J. Wiser, Feb. 1st. Warft. Officer, 2nd Gde., to be temp. Flt. Lt.:—H. J. Lloyd, Feb. 1st.

ADMIRALTY, Feb. 5th.

With reference to the notice which appeared in "Gazette" of Feb. 1st relative to the grant of a temp. comm. as Flt. Lt. to F. E. Rogers, the date should be March 11th, 1917, and not as therein stated.

WAR OFFICE, Feb. 5th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—MIL. WING.—Flt. Comdr.—Lt. H. J. Gibson, Spec. Res., from a Flying Officer, and to be temp. Capt. whilst so emplyd., Jan. 15th.

SCHOOLS OF INSTRN.—SCHOOL OF TECHNICAL TRAINING.—Park Comdr.—Qrmr. and Hon. Lt. (temp. Maj.) E. J. Parker, M.C., R.F.C., from 2nd in comd. (graded as a Brig. Maj), Officers Technical Training Corps, and to retain his temp. rank while so emplyd., Dec. 11th, 1917.

Gen. List.—Qrmr. and Hon. Lt. (temp. Maj.) E. J. Parker, M.C., relinquishes the rank of temp. Sec. Lt. on ceasing to hold the appt. of 2nd in comd. of an Officers' Technical Training Corps, Dec. 11th, 1917.

MEMORANDA.—H. C. Smith to be temp. Hon. Lt. while emplyd. as Asst. Instr. Aeronautical Inspn. Dept., Sept. 26th, 1917.

Serjts., from R.F.C., to be Sec. Lts.:—H. Robinson, Jan. 3rd; H. Butler, Jan. 11th.

The King has been pleased to approve the award of a Bar to the Military Medal to the undermentioned Man:—

7773 1st Air Mech. H. R. Deane, F.R.C. (London, S.W.)

The King has been pleased to approve of the award of the Military Medal for bravery in the field to the following Non-Commissioned Officer and Man:—

44243 2nd Cl. Air Mech. F. F. Dawson, R.F.C. (Metheringham).  
25362 Cpl. S. H. Platel, R.F.C. (Brixton Hill).

ADMIRALTY, Feb. 6th.

R.N.A.S.—Temp. Flt. Sub-Lt. to be temp. Flt. Lt.:—J. C. Beddard, Feb. 2nd. M. Lewis, Feb. 15th.

WAR OFFICE, Feb. 6th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—MIL. WING.—Staff Officers, 2nd Cl.—(Graded as a Brig.-Maj.):—Lt. (temp. Capt.) M. Nicholson, R.F.A., T.F., from the 3rd Cl. (graded as a Staff Capt.), and to be secd., Jan. 4th. 3rd Cl.—(Graded as a Staff Capt.):—Temp. Capt. J. T. North, Res. R. of Cav., and to be transfd. to Gen. List, Jan. 4th.

Flt. Comdrs.—From Flying Officers:—Capt. A. J. Carlow, Cyclist Bn., T.F., Jan. 22nd. And to be temp. Capt. whilst so emplyd.:—Lt. A. J. Mayo, Spec. Res., Jan. 5th; Temp. Sec. Lt. A. V. Milton, Gen. List, Jan. 15th; Lt. E. W. Monk, Lond. R., T.F., Jan. 19th.

Gen. List.—Serjt. L. G. S. Gadpaille, from R.F.C., to be temp. Sec. Lt., Jan. 28th.

MEMORANDUM.—H. S. Porter to be temp. Hon. Lt. whilst emplyd. as Asst. Instr. Aeronautical Inspn. Dept., Dec. 1st, 1917.

WAR OFFICE, Feb. 7th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—MIL. WING.—Wing Comdr.—Temp. Maj. H. A. Van Ryneveld, M.C., Gen. List, from a Sqdn. Comdr., and to be temp. Lt.-Col. whilst so emplyd., Nov. 12th, 1917.

Flt. Comdrs.—From Flying Officers, and to be temp. Capt. whilst so emplyd.:—Sec. Lt. H. E. Rydon, Spec. Res., Jan. 19th; Lt. N. C. Millman, Spec. Res., Jan. 22nd.

Adjts.—Lt. (now Capt.) R. G. Mitchell, R. Scots, and to be temp. Capt. (with the pay and allowances as Lt.) whilst so emplyd., from June 29th to Aug. 20th, 1917; the appt. of Capt. B. G. M. F. Nixon, Ind. Inf., notified in the "Gazette" of Dec. 11th, 1917, is post-dated to Oct. 22nd, 1917.

Equipt. Officers, 1st Cl.—Sec. Lt. (temp. Lt.) A. C. Blackmore, Spec. Res., from the 2nd Cl., and to be temp. Capt. whilst so emplyd., Jan. 15th.

SCHOOLS OF INSTRN.—SCHOOLS OF MIL. AERONAUTICS.—Examining Officers (graded as Equipt. Officer, 1st Cl.).—Temp. Lt. P. C. Hollingsworth, M.C., Gen. List, from an Asst. Instr. (graded as an Equipt. Officer, 2nd Cl.) at a School of Mil. Aeronautics, and to be temp. Capt. whilst so emplyd., Jan. 11th.

SCHOOL OF TECHNICAL TRAINING.—Asst. Instr. (graded as an Equipt. Officer, 3rd Cl.).—Sec. Lt. A. E. Fincher-Brookes, Spec. Res., an Equipt. Officer, 3rd Cl., Jan. 18th.

Co. Comdr. (graded as an Equipt. Officer, 2nd Cl.).—Lt. N. Macgregor, Arb. and Suthd. Highrs., T.F., a Flying Officer (Observer), Sept. 24th, 1917.

\* \* \*

The King has been pleased to approve of the following reward for distinguished services rendered in connection with military operations in Mesopotamia. Dated Jan. 1st, 1918:—

THE MILITARY CROSS.

Lt. (temp. Capt.) L. J. BAYLY, R.G.A. and R.F.C.

AMENDMENT.

The following is the correct description of Lt. John Vincent Tunbridge, A.F.C., whose award of the Military Cross was published in "Gazette" dated Jan. 1st.

WAR OFFICE, Feb. 8th.

REGULAR FORCES.—STAFF.—ATTACHED TO HDQR. UNITS.—Brig. Comdr.—Capt. (temp. Lt.-Col.) R. R. Smith-Barry, R.F.C., Spec. Res., from a Wing Comdr., and to be temp. Brig.-Gen. whilst so emplyd., Jan. 27th.

ESTABLISHMENTS.—R.F.C.—MIL. WING.—Flt. Comdrs.—From Flying Officers, and to be temp. Capt. whilst so emplyd.:—Lt. J. S. Ralston, M.C., Sco. Rif., T.F., temp. Sec. Lt. J. Phillips, Gen. List, Jan. 26th.

Equipt. Officers, 1st Cl.—Sec. Lt. (temp. Lt.) D. A. Pearson, Spec. Res., from the 2nd Cl., and to be temp. Capt. whilst so emplyd., Dec. 3rd, 1917; temp. Capt. A. M. Lester, Middx. R., from an Adjnt., Jan. 19th.

SCHOOL OF INSTRN.—SCHOOLS OF MIL. AERONAUTICS.—Examining Officers.—(Graded as a Flt. Comdr.).—Temp. Sec. Lt. F. H. Beer, Gen. List, a Flying Officer, and to be temp. Capt. whilst so emplyd., Jan. 22nd. (Graded as an Equipt. Officer, 1st Cl.).—Temp. Sec. Lt. J. Morris, Gen. List, from an Examining Officer (graded as an Equipt. Officer, 2nd Cl.) and to be temp. Capt. whilst so emplyd., Jan. 5th.

Asst. Instr.—(Graded as an Equipt. Officer, 2nd Cl.).—Lt. E. E. Macartney, R.G.A., Spec. Res., ceases to hold his appt., and resumes that of Flying Officer (Observer), Oct. 7th, 1917.

ART. AND INF. CO-OPERATION SCHOOL.—Chief Instr.—(Graded as a Sqdn. Comdr.).—Capt. D. R. Gawler, M.C., R. Scots, Spec. Res., a Flt. Comdr., and to be temp. Maj. whilst so emplyd., Dec. 1st, 1917.

Gen. List.—Hon. Capt. C. B. Southey is as now described, and not as in the "Gazette" of Nov. 15th, 1917.

\* \* \*

The King has been pleased to approve of the award of the Military Cross to the following Officers:—

Temp. Capt. GEORGE HENRY HACKWILL, Gen. List and R.F.C.  
Lt. CHARLES CHAPLIN BANKS, R. Welsh Fus. and R.F.C.

For conspicuous gallantry displayed when they engaged and shot down a Gotha raiding London. During the engagement, which lasted a considerable time, they were continually under fire from the enemy machine.

WAR OFFICE, Feb. 9th.

REGULAR FORCES.—STAFF.—Special Appointment.—(Graded for purposes of pay as a Staff Capt. whilst emplyd. as a Brig. Signalling Officer, R.F.C.).—Capt. H. A. Porter, R.G.A., T.F., and to be secd., Nov. 19th, 1917. (Substituted for the notification under "Royal Flying Corps, Mil. Wing," in "Gazette" of Jan. 15th).

ESTABLISHMENTS.—R.F.C.—MIL. WING.—Staff Officers, 3rd Cl. (Graded as a G.S.O., 3rd Gr., at the War Office).—Temp. Capt. S. M. Wood, Gen. List, from a Staff Officer, 3rd Cl. (graded as a Staff Capt.), vice Maj. R. H. Howell, Ind. Cav.) (Graded as a Staff Capt.).—Lt. (temp. Capt.) L. A. K. Butt, S.



Staff. R., from an Adj., and to retain his temp. rank whilst so emplyd., vice temp. Capt. S. M. Wood, Gen. List, Jan. 24th.

Flt. Comdrs.—From Flying Officers, and to be temp. Capt. whilst so emplyd.:—Sec. Lt. M. E. Gonne, R. Fus., Jan. 9th. Sec. Lt. W. L. Douglas, M.C., Lond. R., T.F.; Sec. Lt. J. A. Hutchison, Spec. Res., Jan. 11th. Lt. F. N. Chadwick, Manch. R., T.F.; Sec. Lt. N. P. Dixon, Spec. Res., Jan. 16th.

Park Comdr.—Temp. Capt. J. D. Drysdale, Gen. List, from an Equipt. Officer, 1st Cl., and to be temp. Maj. whilst so emplyd., Jan. 22nd.

Equipt. Officers, 1st Cl.—From the 2nd Cl., and to be temp. Capt. whilst so emplyd.:—Temp. Lt. B. W. M. Williams, Gen. List, temp. Lt. C. Rayner, Gen. List, temp. Lt. R. E. Cook, Gen. List, Jan. 1st. Sec. Lt. (temp. Lt.) R. A. Hassard, Spec. Res., Sec. Lt. (temp. Lt.) S. J. Vine, Spec. Res., Jan. 30th.

SCHOOLS OF INSTRN.—SCHOOLS OF MIL. AERONAUTICS.—Special Appt.—Graded as Sqdn. Comdr.—Lt. (temp. Lt.-Col.) H. E. Chaney, Lan. Fus., from Comdt. of a School of Aerial Gunnery (graded as a Depot Comdr.), relinquishes his temp. rank and reverts to the rank of temp. Maj. whilst so emplyd., Aug. 1st, 1917 (Substituted for notification in "Gazette" of Aug. 25th, 1917.)

Gen. List.—The following relinquish the rank of temp. Capt. on ceasing to be emplyd. as Adjts.:—Lt. H. W. Eaton, R. Scots, T.F., Jan. 1st. Temp. Sec. Lt. C. F. Jex, Gen. List, Jan. 17th.

Temp. Lt. C. S. Fulton, Gen. List, to be temp. Capt. (without the pay or allowance of that rank) while acting as Adj., Jan. 17th.

WAR OFFICE, Feb. 11th.

REGULAR FORCES—ESTABLISHMENTS—R.F.C.—MIL. WING.—Sqdn. Comdr.—Temp. Capt. W. J. Tempest, D.S.O., M.C., Gen. List, from a Flt. Comdr., and to be temp. Maj. whilst so emplyd., Dec. 15th, 1917.

Flt. Comdrs.—From Flying Officers, and to be temp. Capt. whilst so emplyd.:—Temp. Sec. Lt. J. S. Michie, M.C., Gen. List, Dec. 5th, 1917. Temp. Sec. Lt. F. C. Gorringer, Gen. List, Jan. 13th. Sec. Lt. L. Cummings, Spec. Res., Jan. 24th.

Equipt. Officers, 1st Cl.—Capt. (temp. Maj.) A. M. C. Scott, Lond. R., T.F., reverts from a Park Comdr., at his own request, and relinquishes his temp. rank, Jan. 29th, seny. from July 23rd, 1916. Lt. F. M. I. Watts, Worc. R., from the 2nd Cl., and to be temp. Capt. whilst so emplyd., Jan. 23rd.

SCHOOLS OF INSTRN.—SCHOOLS OF MIL. AERONAUTICS.—Instrs.—Graded as Equipt. Officers, 1st Cl.)—And to be temp. Capt. whilst so emplyd.:—Temp. Lt. F. H. Hawksford, Gen. List, from an Asst. Instr. (graded as an Equipt. Officer, 2nd Cl.), Ost. 1st, 1917. Temp. Lt. R. J. G. Temple, Gen. List, from an Asst. Instr. (graded as an Equipt. Officer, 2nd Cl.), Dec. 1st, 1917.

Asst. Instrs.—(Graded as Equipt. Officers, 2nd Cl.)—(Substituted for the notification in "Gazette" of Sept. 22nd, 1917. Temp. Lt. A. D. Broughton, Gen. List, a Flying Officer; temp. Lt. R. J. G. Temple, Gen. List, a Flying Officer (Observer); temp. Sec. Lt. F. J. Martel, Gen. List, a Flying Officer, and to be temp. Lt. whilst so emplyd., May 26th, 1917.

SCHOOL OF TECHNICAL TRAINING.—Instr.—(Graded as an Equipt. Officer, 1st Cl.)—Temp. Capt. M. O. Illingworth, Gen. List, an Equipt. Officer, 1st Cl., Jan. 21st.

WIRELESS SCHOOL.—Asst. Comdt.—(Graded as a Park Comdr.)—Lt. (temp. Capt.) E. Powell, Spec. Res., an Equipt. Officer, 1st Cl., Jan. 1st.

## FROM THE COURT CIRCULAR.

BUCKINGHAM PALACE, Feb. 6th.

The following Officers had the honour of being received by the King this morning, when His Majesty conferred decorations as follows:—

THE DISTINGUISHED SERVICE CROSS.—Flt.-Comdr. William Alexander, R.N.A.S.; Flt.-Comdr. Fred Armstrong, R.N.A.S.; Flt.-Comdr. Gerald Hervey, R.N.A.S.; Flt.-Comdr. Thomas Newton, R.N.A.S.; Flt.-Comdr. Harold Beamish, R.N.A.S.; Flt.-Lt. Samuel Kinkead, R.N.A.S.; Flt.-Lt. Ronald Keirstead, R.N.A.S.; Flt.-Lt. Edwin Hayne, R.N.A.S.; Flt.-Lt. John Allan, R.N.A.S.; Flt.-Lt. Frederic Johnson, R.N.A.S.

THE MILITARY CROSS.—Maj. Leonard Tilney, Household Cav., attd. R.F.C.; Lt. Tempest de Wolf, Canadian Infantry, attd. R.C.F.; Sec. Lt. Victor Allen, South African Infantry, attd. R.F.C.

THE ALBERT MEDAL.—Flt. Lt. Edward Davis, R.N.A.S.

BUCKINGHAM PALACE, Feb. 9th.

The following Officer had the honour of being received by the King this morning, when His Majesty conferred upon him the Military Cross.

Capt. MACDUFF URQUHART, R. Scots, attd. R.F.C.

## NAVAL.

THE CASUALTY LIST.

Reported Feb. 8th.

DIED OF INJURIES.—Brearley, Flt. Sub-Lt. H. B., R.N.

Collett, Prob. Flt. Officer N. C., R.N.

PREVIOUSLY REPORTED MISSING (FEARED KILLED) NOW REPORTED KILLED.—Johnston, Flt. Sub-Lt. W., R.N.

PREVIOUSLY REPORTED MISSING, NOW OFFICIALLY PRESUMED KILLED.—Moir, Flt. Lt. C. J., R.N.

MISSING (BELIEVED PRISONER).—Bronson, Flt. Lt. C. G., R.N.

MISSING.—Williams, Flt. Sub-Lt. F. T. P., R.N.

ACCIDENTALLY INJURED.—Mortimer, Prob. Flt. Officer C., R.N.

Bradley, Prob. Flt. Officer, R.N.

Reported Feb. 9th.

MISSING.—Winter, Act. Flt. Comdr. R. R., R.N.

Wilmot, Flt. Sub-Lt. W. H., R.N.

ACCIDENTALLY INJURED.—Holland, Flt. Sub-Lt. J. H., R.N.

Cameron, Flt. Sub-Lt. J. T., R.N.

## PERSONAL NOTICES.

### DEATHS.

BLACK.—Flt. Sub-Lt. Norman Black, R.N., whose death was officially reported last month, was the younger son of Mr. and Mrs. William Black, of 69, Hamilton Road, Reading. He was educated at Christ's Hospital, entering by competition at the age of twelve; he rose to the high position of Senior Grecian and captain of the school in 1915, and in December of that year gained an open exhibition for Classics at St. John's College, Oxford. He was also captain of the cricket XI. and a member of the football XV. He obtained a commission in the R.N.A.S. direct from school, and after the usual period of training was appointed an instructor. At his own request he was transferred to the fighting squadrons in the autumn of 1917. He was reported by the Admiralty as missing on October 11th, and after an interval of two months his parents received a letter from the Swiss Red Cross saying that he had died of wounds behind the German lines at Wynendaele (between Ypres and Bruges) on October 12th, and was buried in Wynendaele cemetery.

FLOYD.—Prob. Flt. Officer William Eric Floyd, R.N., who was killed in a flying accident on Jan. 21st in his 19th year, was the elder son of Dr. and Mrs. W. R. Floyd, of Devonshire Road, Birkenhead. He was educated at Birkenhead School, where he was a school prefect, captain of the cricket XI., captain of the football XV., and captain of Fives. He was also head of the house in his last year. He was an athlete of great promise, and had taken a prominent part in several of the public school Rugby football games, and was regarded as a player with a great future before him. He left school in July, 1917, and in September joined the R.N.A.S., and had nearly finished his training when the fatal accident occurred.

JEWELL.—Flt. Sub-Lt. Cyril Jewell, R.N., of Henden Manor, Ide Hill, Sevenoaks, and 7, Sloane Street, London, S.W., was accidentally killed whilst flying on Feb. 8th at Basingstoke. He was 19 years of age.

### ENGAGEMENTS.

McCLEAN—WALE.—The marriage arranged between Wing Comdr. F. K. McClean, R.N.A.S., son of the late Frank McClean, F.R.S., LL.D., of Rusthall House, Tunbridge Wells, and Aileen, daughter of Mr. and Mrs. W. H. Wale, of Lapworth, Warwick, will take place, leave permitting, on Saturday, Feb. 16th, at 2.30, at St. Paul's, Knightsbridge. All friends will be welcome at the church.

WRIGHT—CLARK.—A marriage has been arranged, and will shortly take place, between Lt. Comdr. Cecil N. R. Wright, R.N.V.R., son of Mr. and Mrs. Francis H. Wright, of 7, Addington Road, Reading, and Margaret, widow of Sqdn. Comdr. Hew Dalrymple Clark, R.N.A.S., and daughter of Mr. and Mrs. H. L. Savory, of 31, Bramham Gardens.

### MARRIAGES.

MOORE—BECKER.—The marriage took place on Feb. 7th at the Chapel Royal, Savoy, of Flt. Comdr. W. Geoffrey Moore, D.S.C., R.N., second son of the late W. H. Moore and of Mrs. Moore, of Woodfield, Malvern Wells, and Miss Haydee Becker, eldest daughter of Mr. and Mrs. Fred Becker, of Sutton Hall, Heston, Hounslow, and Don Cottage, Aberdeen.

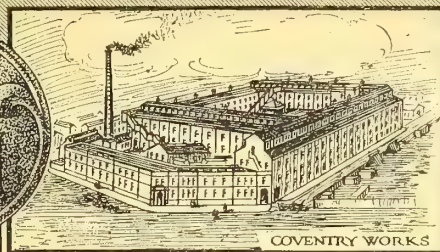
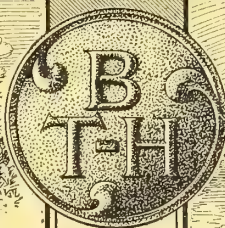
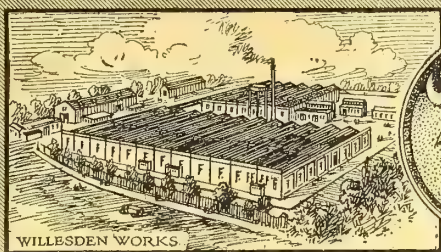
Among the guests were Lord Rothermere, Lord Ventry, Sir John and Lady Bland-Sutton, Sir Vansittart Bowater, Sir Francis Lowe, Mrs. Fred Terry, Mr. and Mrs. Howard Corbett, and Archdeacon and Mrs. Tait.

SAYERS—CAREW.—On Saturday, Feb. 9th, Lt. William H. Sayers, R.N.V.R., was married to Katherine Rosalie Carew.

Lt. W. H. Sayers, whose wedding is recorded hereinbefore, will be remembered as one of the pioneers of British aviation, having been an early experimenter in stability problems with the late Mr. Rowland Ding. Later he was connected with the firm of Howard Flanders, Ltd., and with the Avro Co. Still later he joined the staff of THE AEROPLANE, and contributed many useful articles on the science of aeronautics, besides acting as assistant-editor. His dissertation on stability, published in conjunction with Capt. Barnwell's paper on aeroplane design, is a standard source of education for newcomers to the problems of aeronautics.

On the outbreak of war he joined the R.N.A.S., and was detailed for duty at the R.N. Experimental Station, where he did good work. Certain of the experimental machines built to his



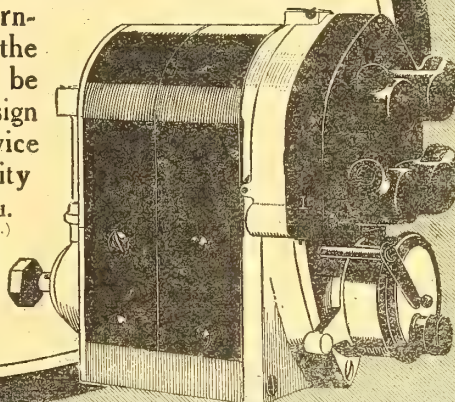


## THE ENTIRE OUTPUT OF B.T.H. MAGNETOS

is at present requisitioned by the Government for war purposes. On the termination of hostilities, supplies will be available for all who value British design and workmanship, reliability in service and the highest standard of Quality

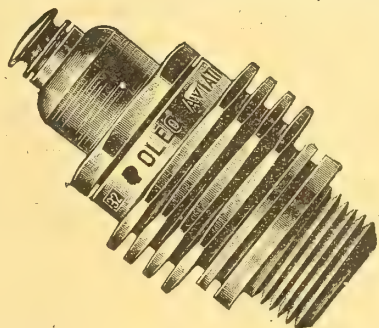
Works - Coventry and Willesden, England.  
(Member of the British Ignition Apparatus Association.)

THE BRITISH THOMSON-HOUSTON CO. LTD.  
Electrical Engineers and Manufacturers.  
Head Office & Works: RUGBY, England.



*The*  
BRITISH THOMSON-HOUSTON CO. LTD.  
Electrical Engineers & Manufacturers  
LOWER FORD ST. COVENTRY, ENGLAND

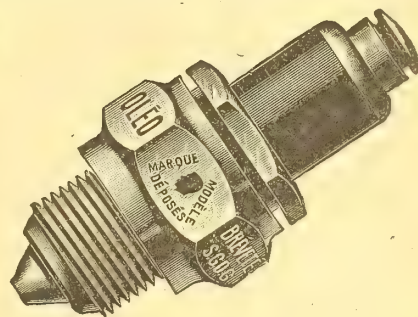
Member of the BRITISH IGNITION APPARATUS ASSN.



TYPE No. 32.



"The Smile of Success."



TYPE No. 27G.

OLEO were the first Aero Plugs ever made.  
OLEO won the Aero Grand Prix SIX TIMES in succession.  
OLEO Plugs have been supplied to the Government since 1913.  
OLEO Aero Plugs have the "Largest Sale in the World."  
OLEO Plugs have won over £30,000 in prizes.  
OLEO Plugs were the first to Loop the Loop.  
OLEO Plugs were the first to Cross the Alps.  
OLEO Plugs are supplied to NINE Governments.

# OLEO

## PLUGS

LEO RIPAULT & CO.  
64A, POLAND ST. LONDON, W.

TELEGRAMS: RIPAULT REC. LONDON. TELEPHONE: GERRARD 7758.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



designs have put up performances previously considered impossible. More recently he has been transferred to the Air Ministry for special duty.—C. G. C.

#### BIRTH.

CADBURY.—On Feb. 6th, at 6, Kimberley Terrace, Great Yarmouth, to Mary (née Forbes Phillips) and Flt. Comdr. E. Cadbury, R.N.—a son.

#### MILITARY.

##### G.H.Q. COMMUNIQUÉS.

FEB. 5th, 9.30 p.m.—On the 4th inst. haze and mist continued to make visibility very bad, although the day was fine.

Several successful reconnaissances were carried out by our aeroplanes, and hostile batteries were effectively engaged by artillery with observation from the air.

Over three tons of bombs were dropped during the day on various targets, including hostile ammunition dumps, and many thousand rounds were fired at the enemy from machine-guns.

On the night of the 4th-5th inst., over one and a half tons of bombs were dropped by us on a hostile aerodrome south-east of Cambrai and on Menai railway station.

Five German machines were brought down in the course of the day in air-fighting, and three others were driven down out of control.

One of our machines is missing.

FEB. 6th, 9.8 p.m.—On the 5th inst. visibility was again indifferent, but a considerable amount of work was carried out by our aeroplanes in conjunction with the artillery, and many hostile batteries were successfully engaged.

Several successful reconnaissances were completed, and nearly five tons of bombs were dropped on hostile railway stations and sidings and other targets.

Hostile aircraft were rather more active. In the course of the fighting our aeroplanes brought down five German machines, and drove down four others out of control. A German observation balloon was also brought down.

Four of our aeroplanes are missing.

On the night of the 5th-6th inst. our machines again bombed an aerodrome south-east of Cambrai, and also hostile billets, dropping one and a half tons of bombs.

All our machines returned.

FEB. 7th, 9.2 p.m.—On the 6th inst. low clouds and mist impeded operations during the morning, but later in the day the weather improved.

Several reconnaissances were carried out by our aeroplanes, and hostile batteries were engaged by our artillery with observation from the air.

Over a ton of bombs were dropped by us on various targets behind the enemy's lines.

Two hostile machines were brought down in air fighting.

Two of our machines are missing.

FEB. 9th, 9.25 p.m.—On the 8th inst. low clouds and rain interfered with flying, but a few bombs were dropped by our aeroplanes on miscellaneous targets.

One hostile machine was shot down in our lines by fire from the ground.

On the night of the 8th-9th inst. our night-flying machines dropped bombs on hostile aerodromes and billets.

All our machines returned.

FEB. 10th, 9.20 p.m.—Several successful reconnaissances were carried out by our aeroplanes on the 9th inst. in spite of low clouds, mist, and high winds.

Hostile batteries were engaged effectively by our artillery with observation from the air, and nearly one ton of bombs was dropped by us on various targets.

In air fighting, one hostile machine was driven down out of control.

One of our machines is missing.

On the night of the 9th-10th inst., our night-bombing machines carried out a successful raid into Germany, although the weather was by no means good.

Nearly a ton of bombs was dropped with very good results on the important railway junction and sidings at Courcelles-les-Metz, south-east of Metz.

One of our bombing machines is missing.

FEB. 11th, 9.25 p.m.—On the 10th inst. the weather was again overcast, with a high wind, which interfered with flying.

Several reconnaissances were carried out by our aeroplanes, and hostile batteries were successfully engaged by our artillery with aerial observation. A few bombs were dropped by us on various targets behind the enemy's lines.

No combats took place.

##### WAR OFFICE COMMUNIQUÉS.

FEB. 7th.—The G.O.C. British Forces in Palestine reports:—

On Feb. 3rd a successful raid was carried out by our air service on enemy camps in the vicinity of Miskeh (in the Plain of Sharon, 15 miles N.E. of Joppa). Forty-seven direct hits were

observed. On Feb. 4th the raid was repeated against the same objectives, 1,900 lbs. weight of bombs being dropped and 37 direct hits observed. All our machines returned safely, although subjected to anti-aircraft gun and machine-gun fire.

FEB. 7th.—The G.O.C. British Forces in Mesopotamia reports:—

On Jan. 31st one of our aviators brought down a Turkish aeroplane, which fell in flames near Khanikin (on the Persian border, 90 miles north-east of Bagdad).

FEB. 9th.—The G.O.C. British Forces in Italy reports:—

Considerable aerial activity during the last week; 15 enemy aircraft were shot down, one driven down out of control, and one balloon burnt. We lost one machine. Hostile bombing of back areas at night continues.

#### THE CASUALTY LIST.

Reported Feb. 6th.

KILLED.—Lovell, Sec. Lt. R. C., R.F.C.

Robinson, Sec. Lt. F., R.F.C.

Smallwood, Sec. Lt. W. S., R.F.C.

Smith, Sec. Lt. R. A., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Ward, Lt. E. A. H., W. Yorks. R., attd. R.F.C.

WOUNDED.—Burton, Lt. B., W. Yorks. R., attd. R.F.C.

MISSING.—Clemons, Sec. Lt. H. S., A.S.C., attd. R.F.C.

Lefevre, Sec. Lt. F. E., M.C., Linc. R., attd. R.F.C.

Taylor, Sec. Lt. L. G., R.F.C.

Reported Feb. 7th.

KILLED.—Saunders, Lt. F. W., Welsh R., attd. R.F.C.

WOUNDED.—Hambly, Sec. Lt. J. H. F., R.F.C.

Reported Feb. 8th.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Campbell, Sec. Lt. J. K., R.F.C.

Oxley, Sec. Lt. M. G. M., R.F.C.

Powers, Lt. B. A., Mdx. R., attd. R.F.C.

Prothero, Capt. P. B., A. and S.H., attd. R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED DIED OF WOUNDS AS A PRISONER IN GERMAN HANDS.—Asher, Sec. Lt. R. S., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN GERMAN HANDS.—Brydone, Sec. Lt. J., R.F.C.

Caunt, Sec. Lt. H. V., W. Yorks. R., attd. R.F.C.

Galer, Sec. Lt. H. E., R.F.A., attd. R.F.C.

Reported Feb. 9th.

KILLED.—Gregory, Maj. R., M.C., R.F.C. (Sec. Lt., Conn. Rang.).

McRae, Sec. Lt. R. G. M., R.F.C.

Wilson, Sec. Lt. M. M., Bord. R., attd. R.F.C.

WOUNDED.—Bulman, Sec. Lt. P. W. S., M.C., R.F.C.

Gonne, Sec. Lt. M. E., R. Fus., attd. R.F.C.

Harold, Lt. J. P. B., R.F.A., attd. R.F.C.

Hutton, Sec. Lt. A. P., R.F.C.

Lawson, Sec. Lt. D. F., Dorset R., attd. R.F.C.

Maclean, Capt. A. M., Yeo., attd. R.F.C.

Thompson, Lt. H. T., R.F.A., attd. R.F.C.

Woolner, Sec. Lt. F. M., R.F.C.

MISSING.—Borthistle, Sec. Lt. W. J., R. Muns. Fus., attd. R.F.C.

Cunningham, Sec. Lt. E., R.F.C.

Milne-Henderson, Sec. Lt. J. M., R.F.C.

Reay, Sec. Lt. S., R.F.C.

Rodger, Lt. K. M., A. and S. H., attd. R.F.C.

Van der Hoff, Sec. Lt. C. L., R.F.C.

Whitehead, Lt. A. G., W. Yorks. R., attd. R.F.C.

Williams, Sec. Lt. L. J., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN GERMAN HANDS.—Cameron, Sec. Lt. I. D., R.F.C.

Cowan, Sec. Lt. R. H., R.F.C.

CANADIAN FORCES.—ACCIDENTALLY KILLED.—Johnson, Lt. A. B., Man. Regt., attd. R.F.C.

Reported Feb. 11th.

KILLED.—Johnstone, Sec. Lt. G. G., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Mathews, Sec. Lt. G., R.F.A., attd. R.F.C.

Wilkinson, Sec. Lt. G. M., D. of Corn. L.I., attd. R.F.C.

AUSTRALIAN FORCES.—KILLED.—Blair, Lt. J. R., Fl. Corps.

Donahay, Sec. Lt. C., Fl. Corps.

\* \* \*

#### CASUALTIES AMONG N.C.OS. AND MEN.

THE DATES ARE THOSE OF THE OFFICIAL LIST.

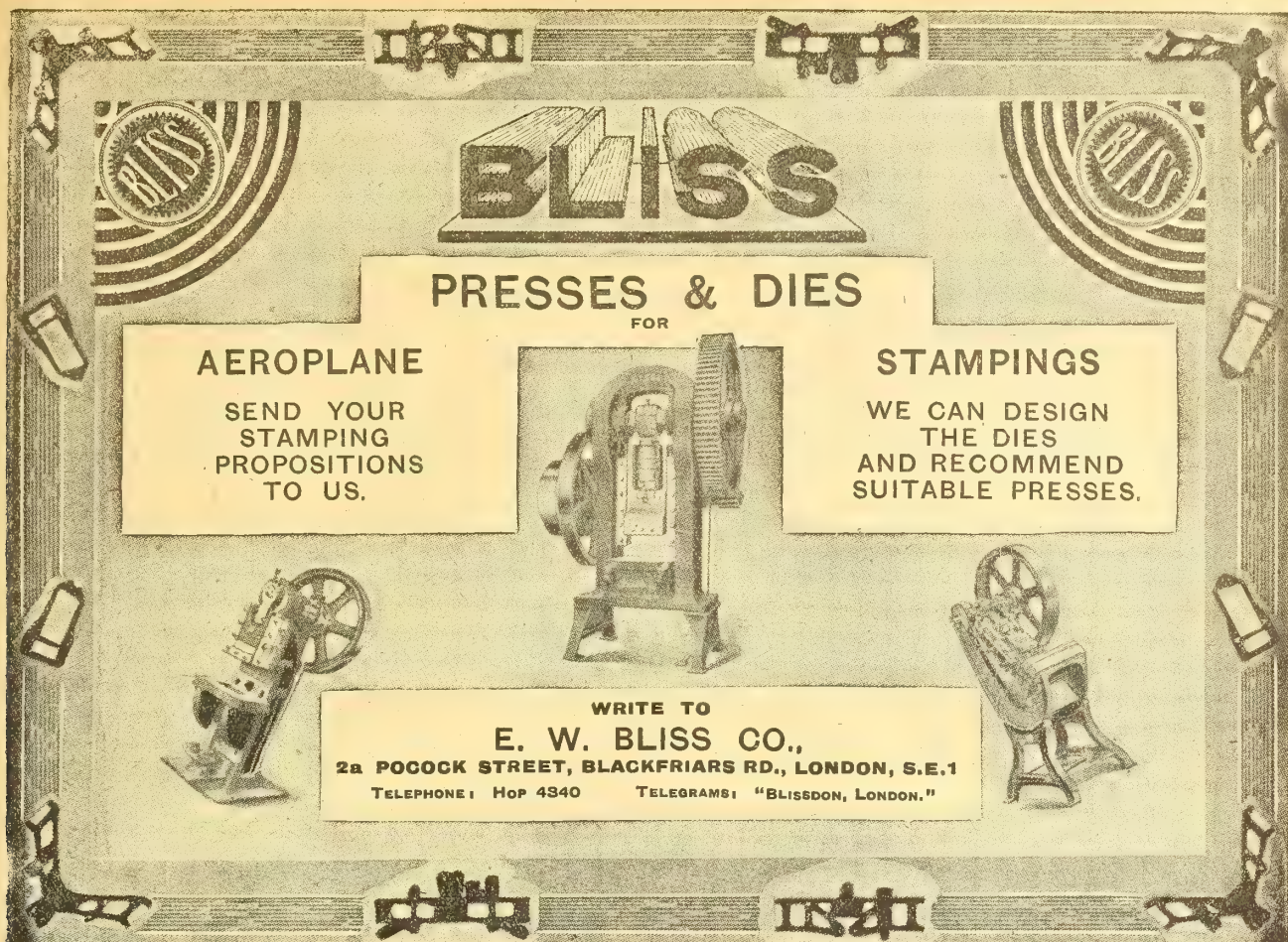
KILLED.

JAN. 31st.—R.F.C.—Roberts 17417 Cpl. C. W. H. (Swindon).

WOUNDED.

JAN. 31st.—R.F.C.—Green 60027 2nd Cl. Air Mech. F. J. (Paignton); McCleery 973 Serjt. W. R. (Ham Common); Mullins 22921 2nd Cl. Air Mech. W. W. (Claygate); Press 29298 1st Cl. Air Mech. J. J. (Kingsland); Sanson 13360 1st Cl. Air Mech. A. G. (Twickenham); Sawyer 20921 2nd Cl. Air Mech. J. W. (Manningtree).





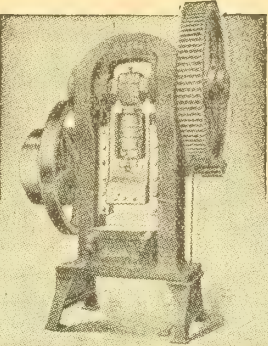
**BLISS**

**PRESSES & DIES**

FOR

**AEROPLANE**

SEND YOUR  
STAMPING  
PROPOSITIONS  
TO US.



**STAMPINGS**

WE CAN DESIGN  
THE DIES  
AND RECOMMEND  
SUITABLE PRESSES.

WRITE TO

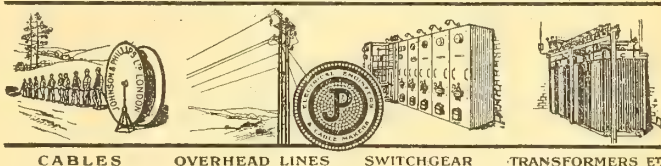
**E. W. BLISS CO.,**

2a POCOCK STREET, BLACKFRIARS RD., LONDON, S.E.1

TELEPHONE: HOP 4340      TELEGRAMS: "BLISSDON, LONDON."



SPECIALISTS IN ELECTRICAL TRANSMISSION AND DISTRIBUTION



*The Illustration shows a section of  
a 20,000 volt three-phase overhead*

## ELECTRIC POWER TRANSMISSION LINE

*lately completed by us for an outlying  
Government Mine.*

*The cheapest method of delivering power  
to Works, etc., in country districts.*

12, UNION COURT, OLD BROAD ST., LONDON, E. C. 2

**JOHNSON AND PHILLIPS LTD**  
ELECTRICAL ENGINEERS & CABLE MAKERS  
**CHARLTON, LONDON, S.E. 7.**

BIRMINGHAM    CARDIFF    GLASGOW    MANCHESTER    NEWCASTLE-ON-TYNE    PORTSMOUTH  
206, Corporation St.    9, Park Place    159, W. George St.    251, Deansgate    44b, Blackett St.    Cleveland Rd Gosport

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



FEB. 1st.—Marston 94367 2nd Cl. Air Mech. G. R. (Stepney, E.);  
Stokes 48669 2nd Cl. Air Mech. P. (Palmer's Green, N.)  
PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF  
WAR IN GERMAN HANDS.  
JAN. 29th.—R.F.C.—Bastick 44969 2nd Cl. Air Mech. F. H.  
(Paignton).

CORRECTION.  
DIED OF WOUNDS.

JAN. 28th.—ROYAL SCOTS.—Cannon 40866 T. (Edinburgh) should  
read  
R.F.C.—Cannon 106064 3rd Cl. Air Mech. T. (Edinburgh).

PERSONAL NOTICES.

DEATHS.

BARLOW.—Lt. Leonard M. Barlow, R.F.C., of Wallington, Surrey, was accidentally killed in the Eastern Counties on Feb. 5th. The machine made a spiral nose-dive from the height of 150 feet and caught fire. Mr. Barlow was 19 years of age.

BARWELL.—Sec. Lt. Humphrey Eames Barwell, R.F.C., who was killed while flying on Feb. 3rd, was the youngest son of William and Emily Compton Barwell, 26, George Road, Edgbaston. He was 19 years of age.

BLACK.—A verdict of "accidental death" was returned at an inquest at West Hartlepool, on Feb. 6th, on the body of Sec. Lt. J. M. Black, R.F.C., of Glasgow, who was killed while flying. He was 19 years of age.

BRENDEL.—Lt. J. D. George Brendel, R.F.C., who was killed whilst flying in Cheshire on Jan. 27th, was the younger son of Mrs. J. D. F. Brendel, 44, Hilldrop Road, London, N.

CALDWELL.—Lt. John Hay Caldwell, Cameron Highlanders, att'd. R.F.C. was previously reported missing, and is now reported killed in action. He was the only son of Mr. W. H. Caldwell, of Morar, Inverness-shire, who is a professor at Cambridge University, and a notable biologist. He was in his twenty-fourth year. He obtained his commission in the Cameron Highlanders in July, 1915, transferring to the Royal Flying Corps in May, 1917.

Jack Caldwell was also a nephew of Major Oswald Watt, late of the French Service d'Aviation Militaire and now commanding a squadron of the Australian Flying Corps on active service. Young Mr. Caldwell had seen much active service in the infantry and had already won a high reputation in the R.F.C. It appears that he was captured by the Turks in Palestine, and it was at first reported that he was a prisoner. When the British Army advanced, his body was found in the desert, and it is surmised that he was killed in attempting to escape. The many friends of the Caldwell and Watt families who are concerned with aviation will offer their deepest sympathy in the loss of so promising a young officer.—C. G. G.

CLARKE.—Lt. Wilfrid Randall Clarke, R.F.A., att'd. R.F.C., who was accidentally killed on Feb. 4th whilst flying in England, was the elder son of R. Feaver Clarke, J.P., Gravesend. He was 26 years of age.

CLAYPHAN.—Sec. Lt. George A. Clayphan, R.F.C., whose death is reported while flying at the front, aged 19, was the eldest son of Mr. and Mrs. F. Clayphan, of Trent Hall, Owston Ferry, Doncaster. He was educated at the Grammar School, Thorne, where he had a brilliant career, gaining many certificates and prizes. He was a keen lover of sport, and a good all-round athlete. On leaving school he was articled to Messrs. Brundell and Brundell, civil engineers, of Doncaster, and after serving a short time with them, he volunteered and was accepted in the Royal Flying Corps. He received his commission in July and in three months became a fully qualified pilot, gained his "wings," and was appointed a flying officer in October. He went to the front on December 1st, and was killed while flying on December 4th.

COLLETT.—Capt. Clive Franklin Collett, M.C., R.F.C., was accidentally killed on Dec. 23rd, 1917, while flying in Scotland.

Born in 1887, he was the second son of Mr. Horace Edwin Collett, of Tanranga, Auckland, New Zealand, and came over shortly after the outbreak of war and joined the R.F.C. in March, 1915.

In the same year he saw several months of active service in France, but a serious accident which occurred while he was bringing a machine to England prevented his flying for a long period and caused him injuries from which he was always troubled afterwards. In spite of this, he insisted on flying again, and in August, 1916, was given command of a flight.

For the rest of that year and for the greater part of 1917 he was engaged in experimental work, for which his experience and ability as an engineer (his profession before the war) and his great skill as a pilot made him especially useful. His courage and coolness were such that he could be relied on not only to execute novel and possibly dangerous manoeuvres in the air, but also to make accurate observations in the course of them.

In September, 1917, he again went to France, and in the short period of two months he brought down 15 enemy machines—all duly authenticated. He won the M.C. and a Bar, and was

sent back to England wounded. He took up experimental work again, and won the highest opinion of all with whom he came in contact.

Captain Collett deserves to be particularly remembered for his gallantry in testing new types of parachutes from aeroplanes, frequently from what would have previously been considered dangerously low levels. His work in this direction will ultimately be the saving of many lives.

As an experimental and demonstration pilot he was unexcelled, and his vivid sense of humour made his demonstrations more enjoyable to those who participated in them. In the course of his work he came in personal contact with the people at all the advanced flying schools in Great Britain, and at every one he made firm friends, so that one may safely say that he was one of the most popular officers in the Corps, though his natural modesty and sense of good form prevented him from ever becoming known to the outside public.

Thus he leaves behind him a high reputation for skill and gallantry, and a host of friends to mourn his loss. Of the many fine lads who have come to us from the Overseas Dominions none has been a finer specimen of the youth of Greater Britain than Clive Collett. This assurance may, at any rate, be some consolation to his bereft family.—C. G. G.

DUNDAS.—Cadet James Robert Duncan Dundas, R.F.C., who died on Feb. 1st at the Canadian Military Hospital, Hastings, was the only son of Robert Napier Dundas, of Inchgarvie, Kelowna, British Columbia, and only 18 years of age.

DYER.—Sec. Lt. Herbert Arthur Dyer, R.F.C., previously reported missing, is now reported killed whilst flying over the German lines on Dec. 7th, 1917. On that date his patrol left the ground before he did, and he had to overtake them, but nothing more was seen of him, and, as he did not return, he was posted as missing. Mr. Dyer joined the Army in 1914, trained with the newly-formed "Arts Corps," and then, being a keen motorist, joined the M.T. branch of the A.S.C., and served for two years in France as a signaller and despatch rider. In December, 1916, he obtained a commission in the Royal Flying Corps, first as an observer and then as pilot. He was 39 years of age, the third and youngest son of the late Dr. Arthur E. Dyer (Mus. Doc., Oxon.), who was for 27 years organist and director of music at Cheltenham College. Mr. H. A. Dyer was a talented musician and composer, and was well known to provincial audiences and in theatrical circles. He was educated at Cheltenham College, and early showed great aptitude for music, taking his degree of Bachelor of Music (New College, Oxon.) at the early age of 22. He then became assistant organist and music master at Rugby School, 1897-1900, organist and choir-master at the Abbey School, Beckenham, 1900, and held a similar position at Bromsgrove School, 1901-1907.

ELLIS.—At an inquest in Hertfordshire on Feb. 11th on Sec. Lt. Douglas Quick Ellis, Canadian Forces, att'd. R.F.C., it was stated that his machine came into collision with another controlled by Cadet Steadman, a young American.

The officers were seen flying about 50 yards apart, both going in the direction of the sun, and they swerved into each other. Both aeroplanes became locked, and descended in flames. Mr. Ellis was found dead in the wreckage, and Mr. Steadman was seriously injured.

[This seems to have been a case in which parachutes would have saved a life and have prevented a serious injury.—Ed.]

GREGORY.—Maj. William Robert Gregory, M.C., R.F.C., of Coole Park, Co. Galway (whose death was announced last week), after being educated at Harrow and New College, Oxford, studied painting in Paris under Blanche, who declared that his work "had reached the highest level of artistic and intellectual merit." He exhibited at the New English and other galleries paintings of West Irish landscape. The Abbey Theatre in its earlier days owed much to the beautiful scenes painted and designed by him, especially for Synge's "Deirdre of the Sorrows," Mr. Yeats's "Shadowy Waters," and his mother's (Lady Gregory) "The Image." He was a fine boxer, and was well known as a cricketer in the Phoenix and his county club, and was a fearless rider in the hunting field and in point-to-point races.

He joined the Connaught Rangers in the autumn of 1915, and in Jan. of 1916 began his training for the R.F.C. He went to France in August, returning to England in the following July after 11 months' continuous active service, and after having been awarded the Military Cross for acts of bravery in the air, and for having "invariably displayed the highest courage and skill," and the Legion of Honour for "many acts of conspicuous bravery." Last autumn he was given command of a Scout Squadron in France, and in November went to another front.

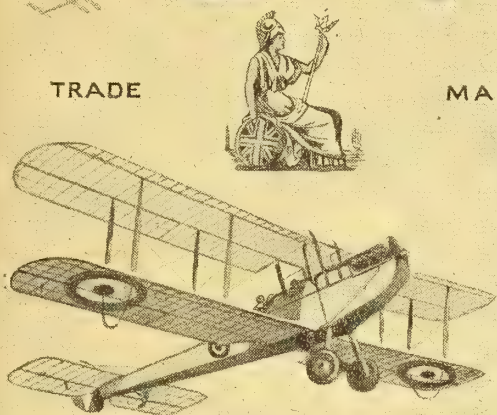
GARRETT.—Sec. Lt. H. T. Garrett, R.F.C., who was reported missing last May, has not since been heard of. He was the elder son of the late Mark Garrett, J.P., of Retreat, South Africa. He was educated at the Wynberg High School. After matriculating he joined the Civil Service, but relinquished his post to join the forces. He left at Retreat a large, well-organised



# Britannia Dope

TRADE

MARK



## Britannia Dopes (NON-POISONOUS) and Varnishes

FOR AEROPLANES  
AND SEAPLANES



FOR FULL PARTICULARS APPLY  
TO THE APPROVED MAKERS—

**ROBT. INGHAM  
CLARK & CO. LTD.**

WALTER HOUSE,  
BEDFORD ST., STRAND, W.C.

Telegrams: "Pearline, Westrand."  
Telephone: Regent 3923.

WORKS .. WEST HAM ABBEY, E.15  
Telephone ... East 955 & 956

# PULVO

## "AN ABSOLUTE BLANK"

*expresses the attainment of  
each of our Presses.*

*We can undertake for  
delivery within the next  
few weeks almost any  
quantity of Pressed and  
Pierced Blanks. We hold  
tools for a very large num-  
ber of De H. parts. We  
can promise, for instance,  
prompt deliveries of 13026,  
13307, 13308, 7308, 13012,  
13094, 13025, 13181, 13311,  
13152 and 13530, and —  
you know our motto—*

**WHAT PULVO PROMISES  
PULVO PERFORMS.**

*We are still in a position  
to undertake immediate  
RADIATOR SHUTTER  
work. Let us come and  
talk to you about it.*

**The PULVO ENGINEERING Co. Ltd.**  
10, 12, 14 and 16, DANE STREET,  
HIGH HOLBORN, LONDON, W.C.1

Telephone :  
Holborn 410

Telegrams :  
Pu'vipult, West-Cent.



troop of Boy Scouts, which he and his brother had formed, and of which he was appointed scoutmaster.

**GOODWIN.**—Sec. Lt. Norman William Goodwin, Middlesex Regt., att'd. R.F.C. (formerly Lt. 25th County of London Regt., Cyclists), has been missing since Sept. 16th, 1917. He is now reported as having been killed in aerial action on that date. Mr. Goodwin was the younger son of the late William Goodwin and of Mrs. Goodwin, 13, Blenheim Gardens, Cricklewood, N.W.

**HARDY.**—Lt. J. Hardy, R.F.C., was killed in an aerodrome accident near Woodstock, Oxfordshire, on February 6th.

**HEWETT.**—Capt. Harold Hewett, M.C., Royal Berkshire Regt., att'd. R.F.C., who was killed on active service on an Eastern front on Jan. 4th, was 25 years of age and the eldest son of Actg. Maj. Sir Harold George Hewett, R.G.A., and of Lady Hewett, Newbury, Berkshire. He passed through Sandhurst, and had his commission in the Berkshires in Feb., 1915, and, joining the Royal Flying Corps, became flight commander in February last year. Capt. Hewett's distinguished service had won for him the Military Cross.

**KEEFE and RILEY.**—As the result of a collision in the air at an aerodrome in Lincolnshire, on the evening of Feb. 5th, two officers, Lt. C. H. Keefe, R.F.C., and Lieut. L. Riley, R.F.C., both of London, were killed.

**LAING.**—Sec. Lt. Darg Laing, R.F.C., who has been killed, was the only child of the late John Laing, of Crossing, Berwickshire, and of Mrs. Laing, of Eskbank, Dalkeith. He was 20 years of age, and was educated at Loretto, and entered the Royal Military Academy, Woolwich, nearly two years ago, but was prevented by an injury to the knee from completing his training there. He received his commission in the Royal Flying Corps last July.

**LEWIS.**—Sec. Lt. Francis Alexander Lewis, R.F.C., who was killed in action on Feb. 5th, after three and a-half years' service, was the second son of Mr. and Mrs. James Lewis, of The Priory, Larkhall Rise, Clapham. He was 25 years of age.

**MORGAN.**—Sec. Lt. Ashton Morgan, R.F.C., who died on Feb. 4th, as the result of a flying accident in England, was the eldest son of Mr. and Mrs. Ernest Morgan, 44, West Side, Wandsworth Common. He was 26 years of age.

**MORGAN.**—A verdict of "Accidental Death" was returned at a Kensington inquest on Feb. 5th on the body of Lt. Chas. Sydney Morgan, R.F.C., aged 29, whose home was at Walton, Liverpool.

In the dense fog on January 31st Mr. Morgan stepped off the platform at West Brompton (District) Station, and was crushed between the wheels of a Wimbledon train and the live rail. In order to extricate him the officials had to raise the coach with jacks, and this took an hour. It was found that his toes had been crushed, his thigh broken, and that he was badly burned by the current. He died two days later.

**O'HANLON.**—Lt. Esmond O'Hanlon, who died on Feb. 3rd, at the Australian Auxiliary Hospital at Dartford, as the result of accident whilst flying on Jan. 29th, was the son of Isabel and Sydney O'Hanlon, of Hale, Cheshire.

**OLDRIDGE.**—Sec. Lt. Peter Henry Oldridge, R.F.C., who was killed whilst flying in Huntingdonshire on Jan. 26th was the only son of Mrs. Oldridge, 40, Hillside Road, Mossley Hill, Liverpool, late of Headingley, Leeds. He was 19 years of age.

**PEACOCK.**—Sec. Lt. Evelyn Jefferies Peacock, R.F.C., who died on Feb. 4th, at a service hospital, as the result of a flying accident, was 18 years of age and the younger son of Mrs. Swinbourne. He was gazetted to the Royal Flying Corps last November.

**SMITH.**—Information has been received through the International Red Cross at Geneva that Capt. Allan Higson Smith, R.F.C., was killed on Aug. 21st, 1917 (the day he was reported missing). Capt. Smith was on Salisbury Plain with the Manchester University O.T.C. at the outbreak of war, joined the Lincolnshires as a private, and was given a commission in a battalion of that regiment. In May, 1915, he transferred to the R.F.C., flying almost daily for 10 months over the Somme in 1916. For brilliant artillery observing he was awarded the Military Cross and made Flt. Comdr. Capt. Smith was for a time commandant of an aerial gunnery school in France. He was the youngest son of Mrs. Higson Smith, of Grimsby. He was preparing for the engineering profession, and had gained his degree B.Sc., Manchester University.

**SPEECHLY.**—Sec. Lt. Tom Martindale Speechly, Hussars, att'd. R.F.C., who was killed on Feb. 8th in an aeroplane accident, was the elder son of Mr. T. and Mrs. Speechly, Uttoxeter. He was gazetted to the 5th Reserve Regiment of Cavalry in December, 1916. He was twenty-one years of age.

**WARD.**—Lt. Edward Arthur H. Ward, R.F.C., grandson of the late John Ward, formerly Chief Constable of Huddersfield, was killed on Aug. 11th, 1917, at the front during his first flight as flight commander. He brought down an enemy machine in flames, and then went to assist a comrade. His commanding officer states he was last seen gliding into the clouds over the enemy line. He was born in Leeds in 1896. In 1914 he won a mathematical scholarship for five years at Hertford College, Ox-

ford, from the Huddersfield College Secondary School, of which he was captain. He enlisted in October, 1915, and was appointed second lieutenant in the 6th West Yorkshire Regiment. He joined the R.F.C. at the end of 1916.

**YOUNG.**—Sec. Lt. John Stevenson Young, R.F.C., who was killed in an aeroplane accident in Scotland on Feb. 3rd, was the only surviving son of the late John Young, coalmaster, Crosslynne, Bearsden, near Glasgow, and of Mrs. Young, Marston, Bearsden.

#### ENGAGEMENTS.

**DAWES—UPTON.**—The engagement is announced of Capt. Richard Wilkinson Dawes, the Prince of Wales's (North Staffs.) Regt. (T.F.), att'd. R.F.C., youngest son of Mr. and Mrs. Edwin Dawes, of Sutton House, Long Sutton, Lincolnshire, to Ruby Grace Apelina, only daughter of Mr. and Mrs. John St. C. Upton, of Market Drayton, Shropshire.

**GORE—BOREEL.**—The marriage arranged between Mr. Ralph Gore, 13th Hussars and R.F.C., and Mademoiselle Wendela Boreel will not take place.

**HAMILTON—MITCHELL.**—The engagement is announced of Lt. Wallace Ferrier Hamilton, R.F.C., youngest son of Mr. and Mrs. Claude Hamilton, of Macedon, Victoria, Australia, and Elsie, only child of Mr. and Mrs. Ernest Mitchell, of 8, Ingles Road, Folkestone.

**MACLEAN—AGAR.**—An engagement is announced between Capt. Alan P. Maclean, Canadians, att'd. R.F.C., and Kathleen Fernihough, daughter of Mr. and Mrs. Thomas F. Agar, Gayton, Parkside, Wimbledon Common, S.W.

**STAMMERS—MUSKETT.**—A marriage is arranged, and will take place on Monday, Feb. 25th, at 2, at St. Mary Abbot's Church, Kensington, W., between Capt. Sidney Robert Stammers, R.F.C., eldest son of Mr. and Mrs. S. J. R. Stammers, of Beaconsfield, Gunnersbury, W., and Muriel, only daughter of Mr. and Mrs. H. G. Musket, Montrose, Gerrards Cross, Bucks. No reception will be held, but all friends will be welcomed at the church.

#### MARRIAGES.

**ANSELL—TARGETT.**—On Feb. 2nd, 1918, at St. Nicholas, Laindon, Lt. Arnold Edward Ansell, Lond. Regt., att'd. R.F.C., was married to Nellie Augusta, daughter of Mr. and Mrs. Fred. Targett, of Winchester, by the Rev. Thos. F. Yule, Rector of Aspley Guise, assisted by the Rev. H. Carpenter, Rector of the Parish.

**DALTREY—GOLDING.**—On Feb. 5th, at Christ Church, Wanstead, Sec. Lt. Frank Daltrey, R.F.C., only son of the late H. A. Daltrey and Mrs. Daltrey, of Ilford, was married to Doris Marjorie, second daughter of the late W. D. Golding and Mrs. Golding, of Snaresbrook.

**FENNIMORE—COLE.**—On Jan. 26th, at the Chapel Royal of St. Peter ad Vincula, Tower of London, Sec. Lt. George Alexander Fennimore, R.F.C., second son of E. H. Fennimore, Esq., of The Bastion, Tower of London, was married to Dorothy Teague, only daughter of Lt.-Col. and Mrs. R. Cole, The Devereux Tower, Tower of London, by the Rev. P. R. Mitchell, C.F.

**GIBSON—BUSTON.**—On Tuesday, Feb. 5th., at St. Peter's, Cranley Gardens, Lt. W. Carmichael Gibson, Hants Regt., att'd. R.F.C., was married to Maude, daughter of Roger Buston, Combe House, Chard.

**HEWETT—TOOMEY.**—On Feb. 2nd Lt. Selwood Hyde Hewett, R.F.C., youngest son of the late Harry Hyde Hewett and Mrs. Hyde Hewett, was married to Lavina Frances Mary, daughter of the late Michael Eugene Toomey and Mrs. Toomey, of Ealing, W., by special licence.

**MERRILL—HUDSON.**—On Feb. 6th, at the Brompton Oratory, Sec. Lt. Walter A. Merrill, R.F.C., of Montreal, was married to Annie L. Hudson, daughter of the late G. B. Hudson, of Frogmore Hall, Herts, and Mrs. Hudson, of 34, Gordon Road, Ealing, W.

**SANCEAU—RUTHERFORD.**—On Feb. 9th, at the Parish Church, Reigate, Capt. Reginald James Sanceau, R.F.C., only son of Mr. and Mrs. Sanceau, "Rokesly," Horley, was married to Marjorie Mary, younger daughter of Mr. and Mrs. Rutherford, "Fairholme," Millway, Reigate, by the Rev. F. C. Davies, Vicar.

**TUCKER—PARKER.**—On Feb. 6th, at Holy Trinity Church, Dartford, Lt. Harold George Tucker, R.F.C., the second son of Mr. W. T. Tucker, of The Gartons, Dartford, was married to Hilda, fifth daughter of Mr. and Mrs. E. Parker, of West Croft, Dartford, by special licence, by the Rev. S. V. Baker, assisted by the Rev. D. R. A. Williams.

**WRIGHT—FLETCHER.**—On Feb. 5th, at Holy Trinity Church, Marylebone, Francis Whitworth Wright, R.F.C., was married to Joyce, second daughter of Dr. and Mrs. H. Morley





# Rotax

## ROTAX AEROPLANE FITTINGS and ROTAX MOTOR ACCESSORIES

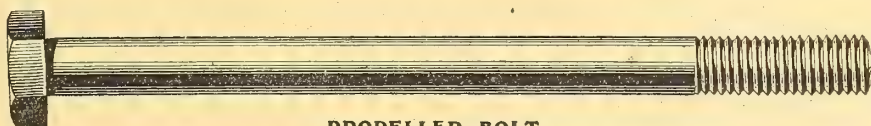
are both made with the same degree of accuracy and reliability that Government requirements call for and service conditions demand.

Special Catalogue of Aero Fittings just published sent on application. Specialities — Electrical Equipment, Streamline Wire and Fittings — Brass and Gunmetal Fittings etc., etc.

The ROTAX MOTOR ACCESSORIES Co., Ltd.

HEAD OFFICES—

Rotax Works, Willesden Junction, N.W. 10



PROPELLER BOLT.

**OUR** works are equipped with all the most modern and up-to-date machinery for the economical manufacture of Engine Parts. We can undertake your requirements. Let us hear from you.

**The Aero Engine Components Company,**  
39, ST. JAMES'S STREET, LONDON, S.W.1.

Telegrams—

407 and 408 Regent.



Fletcher, of 98, Harley Street, London, W., by the Rev. A. C. MacNutt, Chaplain to the Forces, assisted by the Rev. E. N. Sharpe, Rector of the Parish.

#### BIRTHS.

CUNNINGHAM.—On Jan. 29th, at "Eddesbury," West Derby, the wife of Major Jack Cunningham, R.F.A. and R.F.C., of a son (prematurely), who survived only a few hours.

STUART-MACLAREN.—On Jan. 31st, 1918, at Hyères, South of France, to Captain and Mrs. A. Stuart-MacLaren, R.F.C.—a son.

Sec. Lt. John Milne Milne-Henderson, R.F.C., who is reported missing, was trained as an engineer, and was for some years in the City of Edinburgh (Fortress) Royal Engineers before the war broke out. A year ago he transferred to the R.F.C. He was educated at the Royal High School of Edinburgh, and took part in all school sports, winning distinction as a swimmer and boxer.

A service in memory of Sec. Lt. Alan Scott Balfour, R.F.A., att'd. R.F.C., who was killed in action on Jan. 13th, was held at All Saints' Church, Ennismore Gardens, on Saturday, Feb. 9th, at half-past two o'clock.

Maj. Maurice Adam Black, Dragoon Guards, att'd. R.F.C., of The Mount, Meads Road, Eastbourne, formerly of Melrose, North Circular Road, Dublin, who was killed in Macedonia on Feb. 11th, left estate of the value of £66,980.

Lt. H. L. C. McConnell, I.A.R.O., att'd. R.F.C., was reported missing on Nov. 10th, 1917, and is now unofficially reported as having died in Damascus on Nov. 22nd. If any person can give any information concerning Mr. McConnell it will be thankfully received by the Rev. C. J. McConnell, Pyllie Rectory, Somerset.

The "Times" special correspondent writing from The Hague, reports that a party of 96 officers and 215 N.C.Os. arrived at Scheveningen for internment in Holland at 10 o'clock on the night of Feb. 7th. Among the officers were Capt. R. A. Boger, R.F.C., and Capt. V. S. E. Lindop, R.F.C.

Reuter's special agency reports from the British front on Feb. 10th that the atmospheric conditions of the past few days have rendered air work not only difficult but largely futile, but there have been sufficient opportunities for getting observations of the enemy back areas to keep tally of all movements of troops and materials.

The "Morning Post" Special Correspondent on the British Front writes on Feb. 11th as follows concerning the present calm on the Western Front:—

But behind this calm exterior there is extraordinary industry. Our aeroplanes have seen the storm troops rehearsing open warfare far from the front, and the roads and open spaces in Belgium and Northern France have yielded fresh secrets which show the enemy's conditions.

The "Morning Post" special correspondent writing from the British front on Feb. 7th says:—

Raid and restless shelling by the enemy batteries are the sole manifestations of the offensive spirit on the ground, though the German airmen continue to wage a very energetic campaign of their own above the trenches. Thus far the recent increase in their activity has had disastrous results, for their casualties far exceed ours, and the mastery of the skies still rests with us.

On one day there were more than a score of indecisive combats—indecisive because the German airmen, who have developed extraordinary agility in escaping from tight corners, succeeded in turning tail and bolting back to their aerodromes. Wherever they could be cut off and made to fight to a finish they were worsted.

[It now depends entirely on the British working man whether this mastery is maintained or not.—ED.]

#### FRANCE.

##### OFFICIAL COMMUNIQUÉS.

FEB. 5th.—On Feb. 3rd, during the daytime, taking advantage of the fine weather, our chaser aeroplanes displayed successful activity. Real air battles were fought by our pilots against the German squadrons well over the German lines.

Eight German machines were shot down as the result of these fights, and five others fell, seriously hit and probably destroyed.

FEB. 6th.—During the day yesterday one of our bombing

## THE USE OF NAYLOR'S Aero Varnishes

WILL ENSURE A  
PERFECT FINISH

Many years' experience combined with up-to-date methods and scientific selection of materials ensure the production of varnishes unexcelled for durability and reliability.

Some Specialities  
for Aero Work

Woodfillers, Stains, Air  
Screw Varnish, Spar  
Varnish, Float Varnish,  
White Copal Finish for  
Dope, Enamels, Engine  
Paints, Etc., Etc.

Free Samples for trial  
on application.



**NAYLOR BROTHERS (London) Ltd.**  
Contractors to all Government Departments.

Offices: 407/9, OXFORD ST., LONDON, W. Works: SOUTHALL MIDD.

## TAPES WEBS CORDS AND THREADS

for **AIRCRAFT**  
ELECTRICAL & MUNITION WORK.

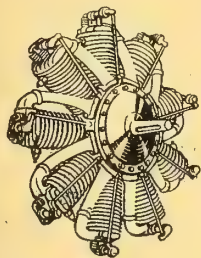
### JOHN MAC LENNAN & Co

30 Newgate St  
LONDON. E.C.1.

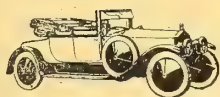
**AND AT GLASGOW.**



# F. W. BERWICK & CO., LIMITED.

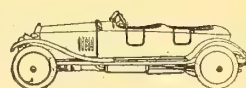


**AEROPLANE & AERO  
Engine Manufacturers  
TO THE AIR BOARD**



**PARK ROYAL, LONDON, N.W.10.**

Telephone: 2493 Willesden (5 lines). Telegrams: "Berwicks, Harles, London."



*Proprietors and Manufacturers of the Sizaire-Berwick Car.*

## SHENSTONE & CO., Ltd.

AIRCRAFT DEPARTMENT.

THIS IS OUR OFFICIAL IDENTIFICATION MARK:—

# 14-S

IT ALSO SIGNIFIES THE TRUE MEANING OF THE WORD

CRAFTSMANSHIP.

## LEYTON

Gen. Manager:  
E. KEITH DAVIES.

Telephone:  
WALTHAMSTOW 24.



squadrons flew over Saarbrücken, dropping with complete success 3,610 kilogrammes of bombs on this important railway junction.

Our squadrons were attacked by several groups of enemy aeroplanes, and, accepting battle, brought down three German machines, and all returned to their lines.

It is confirmed that two enemy machines, which were reported to be seriously damaged on February 3rd and 4th, were actually brought down. This increases the number of machines brought down by our pilots on these two days to five and nine respectively.

FEB. 7th.—During yesterday morning (Wednesday) an enemy machine was brought down by the fire of our anti-aircraft artillery.

ARMY OF THE ORIENT.—Two enemy machines were brought down, one by our artillery, the other in an aerial engagement.

\* \* \*

The "Temps," Paris, Feb. 8th, reports that three of the Gothas which took part in the recent air raid on Paris came to grief on their return to their aerodrome in craters caused by bombs dropped by French aviators.

\* \* \*

It is reported that Serjt.-Maj. Boudon, a French aviator, who was shot down and taken prisoner two years ago, has just escaped from Bavaria after four fruitless attempts.

#### GERMANY.

##### OFFICIAL COMMUNIQUÉS.

FEB. 6th.—Yesterday, seven enemy aeroplanes and one captive balloon were shot down.

Lt. Bongartz obtained his 29th aerial victory.

FEB. 7th.—Serjt. Esswein has shot down six enemy aeroplanes during the last three days.

\* \* \*

Reuter reports from Amsterdam on February 6th that, according to a Düsseldorf telegram published in the "Rheinisch Westfälische Zeitung," the danger from enemy air raids was discussed recently by Marshal von Hindenburg, General von Ludendorff, and several members of the German Government, with a number of burgomasters of German cities, who visited Army Headquarters for the purpose.

The Burgomaster of Düsseldorf reported on these deliberations at a sitting of the Municipal Council. He declared that visitors were given exaggerated reports of the effects achieved by hostile aviators, these exaggerations being undoubtedly traceable to enemy influence.

\* \* \*

Mr. H. Patrick Devitte, the "Daily Express" correspondent at Geneva, writes on Feb. 11th:—

Two enormous new Zeppelins made their first aerial trials above Lake Constance yesterday. They are now to be sent to a German port.

It is also stated that the new Zeppelins will carry a perfected system of gas emission to conceal their movements.

[The notion of a Zeppelin emitting gas to conceal its movements is something new. One would have thought the emission of ballast more effective.—Ed.]

It is stated that twelve new Gothas are approaching completion on the lake side.

[Some air fleet!—Ed.]

#### ITALY.

##### OFFICIAL COMMUNIQUÉS.

FEB. 5th.—Desultory and intermittent artillery actions and lively aerial activity along the whole front.

During yesterday 13 enemy machines were shot down, five of them by our own aviators in the Val Stagna (Brenta front) and eight by British aviators between the Piave and the Livenza and east of the Montello.

During the night our airships bombarded military transports on the Conegliano Casarsa railway line (east of the Livenza).

Before dawn this morning Padua was attacked again by enemy aviators, who dropped bombs in the centre of the town, causing damage to the buildings and wounding a few persons.

FEB. 6th.—Yesterday our own and British bombing flights attacked with good effect enemy troops in the vicinity of Primolano and the aviation ground of San Giacomo di Veglia respectively. A large fire was caused by our airships in the ammunition stores of San Stino di Livenza.

Five hostile machines were brought down, two of them by our own and three by British aviators.

Venice, Mestre, and Treviso were bombarded once again yesterday after sunset. Neither casualties nor damage are reported.

FEB. 7th.—Between the Adige and the Brenta, a few aerial combats, in the course of which British aviators shot down an enemy machine.

Calviano (south-east of Brescia), Bassano, and again Treviso and Mestre were bombed early yesterday morning by hostile aircraft, causing little damage and a few casualties.

One of our airships reached last night the aviation ground of S. Giacomo di Veglia (south-east of Vittorio), dropping one ton of high explosives.

## UNDERCARRIAGES

A. V. ROE, TYPE 504.

FOR IMMEDIATE DELIVERY.

ENQUIRIES INVITED FOR WOODWORK AND METAL SPARES.



JOSEPH G. NAVARRO,

AERONAUTICAL ENGINEER,  
BRANSTON ROAD,

BURTON-ON-TRENT

# PLYWOOD

In all Thicknesses and Qualities.

SIBERIAN & GENERAL TRADING CO., Ltd.,

1-3, Leonard Street, City Road, LONDON, E.C.2.

Telegraphic Address: "Wolosey, Finsquare, London." Telephone: London Wall 3577.



The All  British  
**Standard**  
 **LIGHT CAR**



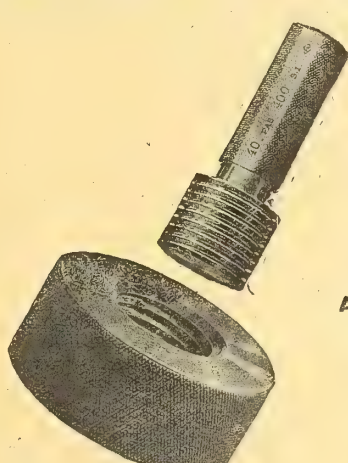
**ALWAYS  
A  
SURE  
PILOT**

Your name and address now will ensure your receiving details of our post war models when ready

**The Standard Motor Co., Ltd., Coventry.**

London Agents: The Pytchley Autocar Car Co., Ltd., 216, Gt. Portland Street, W.

**LIMIT GAUGES**  
AS SUPPLIED TO  
**A.I.D.**  
AND  
**THE MINISTRY OF MUNITIONS.**



**ABSOLUTE  
ACCURACY.**

Particulars from  
**LEO. RIPAUT & CO., 64a, POLAND ST., LONDON, W.1.**  
Wires—Ripault, London. 'Phone—Gerrard 7758.

*Of special  
interest to Government  
Contractors.*

**J.B. BROOKS & CO.**

Contractors to the Admiralty, War Office, Air Board, Ministry of Munitions, etc.  
And the Leather Specialists with the Largest Works, Finest Equipment, Best Facilities, and widest experience in the Trade, invite enquiries for Articles, Parts, Fitments, and Cases of

**LEATHER**

*J.B. Brooks & Co. Ltd.  
104 Criterion Works  
Birmingham.*

**Alldays**  
"EMPIRE"  
**Positive Pressure Blower**

For use in the construction of Aeroplanes.

This Blower is specially suitable for Gas and Oil Furnaces, Blow Pipes, or any other work requiring a uniform steady pressure.

*Simple in construction and positive in action.*

Ask for Stock sizes, mentioning Department W.

**Sole Makers Alldays & Onions**  
Pneumatic Engineering Co. Ltd.  
**BIRMINGHAM**  
And at  
**58, Holborn Viaduct, LONDON.**





The number of hostile machines brought down from Jan. 26th to the 6th inst. by our own and our Allies' aviators reached 56.

FEB. 8th.—During the night of the 6th-7th instant one of our airships, after difficult navigation, reached the hostile aviation ground of Motta di Livenza (east of the Piave), dropped one ton of explosives with very good results, and returned safely to her base.

FEB. 10th.—A strong squadron of seaplanes of our Navy bombarded, with very good results, the enemy's trenches and huts on at Revedoli (mouth of the Piave).

FEB. 11th.—One of our aviators shot down two enemy aeroplanes; one of them fell to the north of Piovene (south-west of Asiago), and the aviators were captured; the other was brought down in flames in the neighbourhood of Valli dei Signori (north-west of Schio).

\* \* \*

A semi-official statement of Feb. 11th says:—

Seaplanes of the Royal Navy crossed the Adriatic and reached the coast of Dalmatia, flying over the channel and almost to the Sabbioncello Peninsula. They were the object of intense fire from anti-aircraft artillery, but they carried out with evident success a bombardment of the military works on the island of Curzola. The machines returned undamaged after a flight of about four hours.

\* \* \*

According to reports received regarding the air raid of Feb. 4th, on Padua, about ten aeroplanes dropped some sixty bombs, scattering them in various localities. Several private houses were damaged. Bombs fell near the churches of Santa Giustina and the Eremitani. The cathedral and the Church of San Francesco were also damaged. The ancient Hospice of the Confraternita della Carita, containing frescoes of the school of Titian, was also struck by a bomb, but the damage is not serious. Some hospitals were also hit, and the Albergo d'Italia was completely demolished.

King Victor Emmanuel, who visited the stricken areas, was the object of a patriotic demonstration by the population.

\* \* \*

The correspondent of the "Times," writing on Feb. 5th, from Italian Headquarters, says:—

German and Austrian machines have been very busy lately dropping leaflets on and behind the Italian lines. These are signed, "the Austro-Hungarian soldiers," and incite the Italian Army to conclude peace with them, and giving the designedly false impression that Bolshevik formations are arising in the Austrian Army. Others declare that Italy is "the latest British Colony," with a British censorship in Naples and a Kommandatur and military governorship in Rome, and that British troops have fired on rioters in Milan—all, of course, preposterous nonsense.

There is good reason to believe that the night raiders on Padua and other towns are all Germans flying A.E.G. three-seater bombing machines, and belonging to specially-trained formations, from the German air camps in Belgium.

\* \* \*

A message from Rome on Feb. 9th says:—

The "Tribuna's" correspondent at the front says three German aviators who have been captured recently have made a statement to the effect that as a consequence of the Pope's request the Austrian Emperor forbade the bombardment of Italian open towns. The German aviators protested, and were supported by their commander, and subsequently the German General Staff ordered that no notice was to be taken of the orders from Vienna, and such bombardments should continue.

[One can quite appreciate the annoyance of the German Staff at the well-meant efforts of his Holiness to palliate the horrors of war. Unless one pleads for tin bayonets and indiarubber shells at the same time, such protests are rather idle. The style of any belligerent bombing aviator must of necessity become cramped if he is to be certain that no non-combatant is to be subjected to risk.—Ed.]

# A.G.S. WASHERS

Wire  
Work.

# THIMBLES

Turn Buttons.  
Eyelets.  
Washers.

# UNION NUTS & NIPPLES.

Tel.: 550 Central  
Tel. Ad.: BRISK, BHAM.

W. H. BRISCOE & Co., Ltd.,  
51, 52, 53, PARK STREET,  
BIRMINGHAM.

# Lang Propeller

LTD.

Contractors to  
the Admiralty  
and War Office.  
WEYBRIDGE,  
SURREY.

SIXTH EDITION, 1918. © 1918 D. J. L.  
**DYKE'S AUTO-ENCYCLOPEDIA.**

**THE STANDARD WORK ON MOTOR MECHANISM**

Sanction has been given for this Book to be supplied through H.M. Stationery Office to Schools of Military Aeronautics.  
Adopted by the American Government (War Dept.) for use in all their Aviation Schools.

**A Thorough, Practical & Simple Treatise  
on Principle, Construction, Repairs and  
Troubles—and How to Remedy Them.**  
**THE BOOK for the EXPERT and the STUDENT.**

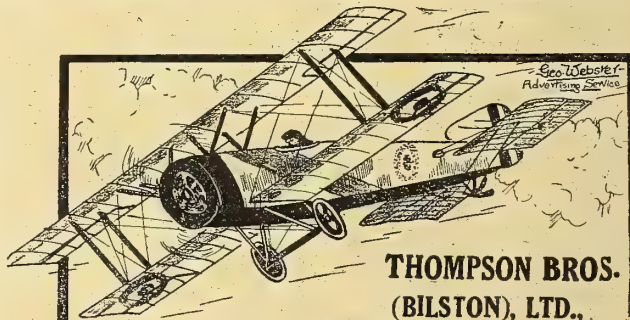
Containing upwards of 900 pages. 775 Illustrations on Electrical Subjects;  
1,189 Illustrations on Repairs and Adjustments. 300 Illustrations on "The Ford."  
5 Coloured Inserts.

OVER 250,000 COPIES SOLD.

Price **£1 : 1 : 0** net, post free, cash with order,  
from your Bookseller, or direct from the Publisher,

**S. G. GILLAM, Dome Building, RICHMOND, SURREY.**

\* \* \* Prospectus on Application.



**THOMPSON BROS.  
(BILSTON), LTD.,**

— FOR —

**UNDERCARRIAGES  
TUBULAR FRAMEWORK  
AERO. DEPT., BILSTON, Staffs.**



# AEROPLANE

We are making various Parts for Aeroplane Construction, and invite your inquiries for

Tubes and Tubular Construction. Sheet Metal Pressed Parts, Wheel Rims and Special Sections in Steel of any length, gauge or width. Brazing, Acetylene, and Electric Welding, etc.

Let us know your needs—you can depend upon us to give them prompt and careful attention,

**THE LOMBARD  
RIM & TUBE CO.,**

Lombard Street,  
BIRMINGHAM.

## PARTS

## THE BURFRON Burberry Weatherproof

is a safeguard on which airmen rely for complete immunity from effects of cold and wet.

THE BURFRON winds round the figure without leaving openings anywhere to admit rain or wind, and is held together securely by a button at the neck. THE BURFRON is made in dense Burberry-woven and proofed material which resists penetration by wet or cold yet, being free from rubber or other air-tight agent, allows perfect natural ventilation.



Complete Kits in  
2 to 4 Days or  
Ready-to-Wear.

During the War BURBERRYS  
CLEAN AND RE-PROOF  
Officers' Burberry Weather-  
proofs **FREE OF CHARGE**

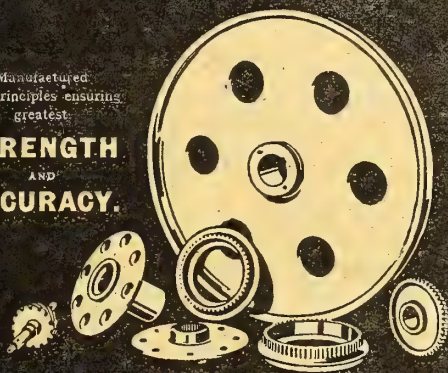
Military  
Catalogue  
post free  
on  
request.

**BURBERRYS** Haymarket S.W. LONDON  
8 & 10 Bd. Malesherbes, PARIS; also Provincial Agents

## MOSS- AERO-ENGINE GEARING

Manufactured  
on principles ensuring  
greatest

**STRENGTH  
AND  
ACCURACY.**



**GEARING — FLYWHEELS — CAMSHAFTS**  
R.A.F. PROPELLER BOSSES

Our Aero parts are made in specially **HIGH TENSILE STEEL**, heat treated and all parts corrected for distortion.

**TRANSPORT, LORRY & PLEASURE CAR GEARING**

Bevel and Worm Drives accurately generated. Steering Worms and Sectors. Spur and Bevel Differentials. Gear Box Gears. Camshafts with guaranteed Glass-hard Cam Profiles.

## -GEARING

**THE MOSS GEAR CO., LTD.**

W. DUCKITT Managing Director Thomas St., Aston, BIRMINGHAM

HIGH-CLASS

## ALUMINIUM CASTINGS

FOR ALL TRADES.

We Specialise in Aluminium Cylinders and General Aero and Motor Engine Castings,

## CAST IRON CYLINDERS

Water and Air-cooled for Aero & Motor Engines

ALL THE ABOVE CASTINGS  
TO GOVERNMENT SPECIFICATION.

**WILLIAM MILLS, LTD.,**

Atlas Works :: Grove Street,  
**BIRMINGHAM.**

ALUMINIUM AND IRON FOUNDERS.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



The Italian correspondent of "The Aeroplane" writes:—

I saw in a letter that there was a most gallant rush to fly off spare machines from the advanced camps when the retreat was decided upon. Elderly no-longer fliers, and pupils not quite yet so, took awful risks rather than leave things about for the Hun. [Some of the old R.F.C. people may remember something like it in the retreat from Mons. Not only so, but there was then the greatest anxiety to save machines which were really hardly worth saving.—Ed.]

#### A WELL-SPENT EVENING.

On Saturday, Feb. 9th, the proprietors of the London Aircraft Co., of Urswick Road, Lower Clapton, entertained their employees to a dance and a concert at the Holborn Hall, where a very good programme was provided, and the satisfactory way in which the whole function was conducted reflects the high state of organisation existing at the London Aircraft Company's works.

The local talent was of a very high order, and special mention must be made of songs by Mr. Victor Clements who did honour to the French guests by singing the "Marseillaise" as it is seldom heard outside France.

Early in the evening Mr. J. J. Morch, the general manager of the company, entertained a small party of friends to dinner at the Holborn Restaurant, after which those present adjourned to the Holborn Hall, and took part in the larger function.

#### A USEFUL HUN.

In view of the part that the Mercedes engine has played in aerial attacks upon London and elsewhere in this country, a story of the fate that has befallen an earlier Mercedes product is of interest.

A little while ago the New Welding Company received for repair an engine that had at one time formed part of a famous racing car. It was, however, in a truly deplorable state, being extensively cracked, and very badly strained and distorted, with bearings out of alignment and all the cylinder faces out of truth. It had, in fact, been virtually scrapped for quite a long time, until it has occurred to someone that this engine was of just the type and kind required for driving a small dynamo at a well-known works in the country—that is, if it could be successfully repaired. Thus it found its way to Rosebery Avenue, London, E.C., where this very complicated and tricky job was so successfully tackled that within a few days it was duly performing its allotted task, and has been running continuously ever since.

## LIGHT STEEL STAMPINGS FOR AEROPLANES

Any size or weight :  
Rough or Machined :  
Single Piece or Com-  
bination pressed and  
welded by Oxyacety-  
lene & other processes

JOSEPH SANKEY  
AND SONS, LTD.,

Hadley Castle Works,  
WELLINGTON,  
Shropshire.

## Aircraft Fittings.

### GABRIEL & CO.

**Manufacturers of  
AEROPLANE FITTINGS in BRASS,  
COPPER, GUN METAL, BRONZE  
AND CLARUS ALUMINIUM.**

Castings supplied either Machined complete or in the rough.

Sheet Metal Work in Brass, Copper, Steel, Tin, or Aluminium. including Spinings, Stampings and Pressings.

**A.G.S. FLANGES, PETROL FILTERS, ETC.**

Tube Bending and Capstan Work a speciality.

**Contractors to Admiralty, War Office,  
Ministry of Munitions, H.M. Air Board,  
Royal Aircraft Factory and Crown  
Agents for the Colonies.**

TEL. ADDRESS:  
GABRIEL, BIRMINGHAM  
TELEPHONE:  
CENTRAL 1223.

**4 & 5, A. B. ROW,  
BIRMINGHAM**

## PROPELLERS ONLY.



**CONTRACTORS TO  
H.M. GOVERNMENT**



Office & Works—  
Propeller Works,  
Balm Road,  
Hunslet,  
Leeds.

Telephone—  
Central 291.  
Telegrams—  
Aircscrews, Leeds.



**BLACK  
ENAMEL.****AEROPLANE  
GREY PAINT (flat).  
Oil and Petrol  
Resisting.****TRANSPARENT  
WOOD FILLER.****Subject to  
A.I.D.  
Inspection.**

# HARLAND'S

## VARNISHES, ENAMELS AND FINE COLOURS.

By Appointment to



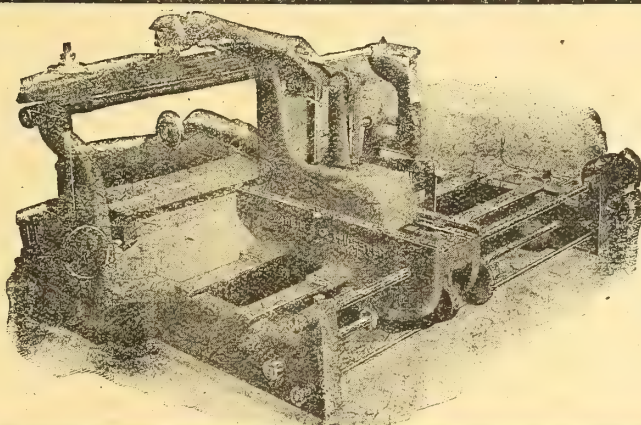
His Majesty the King.

**MERTON, LONDON S.W.19.**

ESTABLISHED 1791.

**GOPAL  
VARNISHES  
for  
AIRSCREWS  
and  
EXPOSED  
WOOD PARTS,  
&c.****WHITE DOPE  
RESISTING PAINT.****Subject to  
A.I.D.  
Inspection.**

## AUTOMATIC PROPELLER SHAPER K.E.

As supplied to all the  
leading propeller  
makers.

Every blade identical.

Less balancing required

Saves labour.

Increases output.

Write for list of users.

**WADKIN & CO  
LEICESTER.**Telegrams: "Woodworker."  
'Phone: 3614/5.

Are YOU interested in Flying? If so, why are YOU not taking

## The Nottingham Flying and Correspondence Schools, Ltd., Course?

The Imperial Flying Service Pilots say it is the Best in the Country.

Write for Particulars and Illustrated Book issued Free.

**32, KING STREET, NOTTINGHAM.**

'Phone 5766.

**R. F. & F. W. BROWN**

(F. W. BROWN.)

**Wollaton Saw Mills  
Near Nottingham**

# ENGLISH ASH FOR AEROPLANES

## Bent Timber Manufacturers.

Telephone .. 1526 Nottingham.

Telegrams .. Browns, Sawmills, Wollaton.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



THE  
**"BOWSER" AEROPLANE SEATS**

(Made to A.G.S. Drawing 264).

Supplied to the Royal Aircraft Factory and the Leading Aircraft Manufacturers.

Manufactured by **EDWARD BOWSER, 50, Park Lane, Leeds.** Tel. No.: Central 3473.

Under the A.I.D. Inspection.

Northern Representative—

Mr. **WALTER M. DANIELL,**

33, East Beach, Lytham.

**RUBBER P.R. TUBINGS APPROVED A.I.D.,**

'Phone:—CITY 3811 and 3812.

WASHERS, RINGS, BUFFERS, SHEET, STRIP, MATTING, MOULDINGS.

**JAMES LYNE HANCOCK, Ltd., 266 Goswell Rd., London, E.C.1**

**HIDE GLUES** *FOR AIRSCREWS AND  
 AIRCRAFT CONSTRUCTION.*

— APPROVED BY H.M. ADMIRALTY AND A.I.D. —

Manufacturers—**Wm. OLDROYD & SONS, Ltd., 9, Mincing Lane, London, E.C.3.**

Telephone: 4978 Avenue.

**STANLEY PROPELLERS**

By the **STANLEY AVIATION CO.,**

TELEPHONE  
 DALSTON 45.

CHATHAM PLACE, MORNING LANE,  
 HACKNEY, LONDON.

GOVERNMENT  
 CONTRACTORS.

Telephone—East 3833.

**THE STANDARD Aircraft Manufacturing Co., Ltd.**

28, BOW COMMON LANE, LONDON. E.3.

**EBORA**  
 PROPELLER  
 Company  
 112, 12 Surbiton Park  
 Terrace KINGSTON  
 3 on Thames  
 Telephone  
 KINGSTON 672  
 Telegrams  
 EBORA, KINGSTON

*Ebora Propellers*

Contractors  
 to the Admiralty  
 and War Office  
 SCHOOL PROPELLERS  
 FOUR BLADES  
 SEAPLANE PROPELLERS  
 SLATE TABLES FOR  
 PROPELLER WORKS

**Aeroplane Steel Sheets**

as supplied by us to

**The Royal Aircraft Factory  
 and leading Aeroplane Makers**

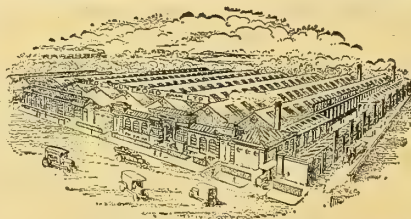
Guaranteed to comply with the R.A.F. No. 9A  
 specification. Stocked in all gauges. (Sheets  
 are passed and stamped by the "A.I.D.")

**BERNARD NICKLIN & CO.**

IRON AND STEEL WAREHOUSE  
 SMETHWICK, BIRMINGHAM

Telegraphic Address:  
 "Bernico," Birmingham.

Telephone No. 1  
 224 Smethwick.



A Modern  
 Factory  
 replete  
 with every  
 modern  
 facility.

**"FREMO" TAPER  
 PINS.**

Every "FREMO" pin is turned out with a view to adding to  
 a lead already won for **THE UTMOST RELIABILITY.**

*Fred Mountford & Son, Ltd.*

**FREMO WORKS, LIFFORD, BIRMINGHAM.**



'Phone: CAMBS. 5.

THE

Wires: "CARBON," CAMBS.

**Cambridge School of Flying****30b, St. Andrew's St., Cambridge.**beg to announce to **Manufacturers,**  
Engineers, Inventors, etc., that in addition to their**FLYING COURSE** (Prospectus on Application) and  
**CORRESPONDENCE COURSE**(Thorough and Up-to-date tuition) they are prepared  
to undertake **Tracing, Preparation of Working Drawings,**  
**Detail Design, Patent Specification Drgs., etc.****QUICK DELIVERY—CAREFUL WORK—MODERATE CHARGES.**  
Enquiries to "Design Dept."**Berling Magneto**  
insures a hot, fat  
spark at any  
altitudeWorth more  
Does moreManufactured  
by the  
**Ericsson Mfg. Co.**  
**Buffalo N.Y. U.S.A.**Manufacturers  
.. of ..**PHOSPHOR BRONZE,****GUN METAL,**

MANGANESE BRONZE,

**BRASS & COPPER**TUBES, SHEETS,  
RODS, WIRE, AND**CASTINGS.**PHOSPHOR TIN,  
PHOSPHOR COPPER.**CHARLES CLIFFORD & SON, LTD.,**  
**BIRMINGHAM.****Aluminium**  
**Castings***Sand or Die*  
*of every*  
*Description*  
2 HP to 600 HP  
BEST METAL  
GOOD CASTINGS  
QUICK DELIVERIESContract L to  
H.M. Government**Chill Castings for**  
**Aeroplanes a Speciality**Telephones: Telegrams:  
3846 City. Krakauer,  
4879 Central. Isling, London**R W COAN**  
*The Aluminium Foundry*  
219, COSWELL ROAD,  
LONDON, E.C.COAN  
CASTS  
CLEAN  
CRANK  
CASES**SALMSON**  
**AERO-ENGINES**

(Canton-Unné System).

All enquiries should be addressed to

**THE DUDBRIDGE IRON WORKS, L<sup>d</sup>.**  
**STROUD,**  
**GLOUCESTERSHIRE.**

London Office:

87, Victoria Street, S.W.1,

*The Air Navigation Co., Ltd.***BLERIOT & SPAD**  
**AIRCRAFT WORKS,**  
**ADDLESTONE (SURREY).****Contractors to War Office and**  
**Admiralty.****Flying Ground—Brooklands Aerodrome.****NORBERT CHEREAU, Managing Director.**

Telegrams—Bleriot. Weybridge.

Telephone—353 Weybridge.

**"CROID"**  
**LIQUID GLUE**  
'Approved' by 'A.I.D.'  
Sole Manufacturers:  
**The Improved Liquid**  
**Glues Co., Ltd.,**  
Gt. Hermitage Street  
London, E.  
Contractors to H.M.  
Government.**CLABOUR-WESTBAY**

:: FOR ::

**2.B.A. Bolts—A.G.S. 103**Entire Output at present absorbed  
—by Government Requirements.—**W. A. Clabour, Westbay & Co.,**  
**KIRKSTALL, LEEDS.** Ltd.

Phone: Headingley 709.

Telegrams: Clabour, Kirkstall.



## TRADE CARDS.

## AEROPLANE TIMBER SPECIALISTS

**JOSEPH OWEN & SONS, Ltd.,**  
**Borough Saw Mills, LONDON, S.E.**

Telephone: HOP 8811 Telegrams: "BUCHERON, SEDIST."

## Advertising

For GOOD ADVERTISING consult  
 Godbolds, 8, Breems Buildings,  
 London, E.C.4. Estimates Free.  
 Phone: City 5912. E. H. Godbold,  
 Director



## JAMES NORTH HARDY &amp; SON, LTD.,

54, PORTLAND STREET, MANCHESTER,  
 MANUFACTURERS of all descriptions of COTTON and LINEN  
**WEBS, TAPES & TWINES FOR AIRCRAFT  
 AND ELECTRICAL WORK.**

London Branch: 3, FITCHETT'S COURT, NOBLE STREET, E.C.6.  
 Mills: HEATON PARK, nr. MANCHESTER.

Tel. Add.: "Hardson," Manchester Phone: No. 6471 Central.

## FREDK. WARD

— FOR —

## Aero Engine and Gun Gear Parts

ALSO PATTERN AND JIGS.

**ALLSOP ST., UPPER BAKER ST., N.W.**

Phone: Paddington 4743.

## NAME PLATES.

WE SPECIALISE IN EVERY DESCRIPTION OF  
 NAME PLATES IN METAL, IVORINE, ETC.

**CLEGG METAL ENGRAVING CO.,**  
 CHATSWORTH WORKS, WORTHING.

ALWIN ENGINEERING CO., AERONAUTICAL  
 LUTHER ROAD, TEDDINGTON, S.W.

Tel. No. Kingston 2412.

Makers of all kinds of Aircraft Fittings. Presswork a Specialist  
 Pressings for DeH4, 5, 6, 9, etc. AVRO, SOPWITH, FAIREY and  
 many other types.

On receipt of Post Card our Representative  
 will call and give immediate quotation.

## Springs! Springs! Springs!

We make a speciality of  
 Springs for Aeroplanes.  
**SEND FOR PRICES.**

**Dart Spring Co., West Bromwich.**

## SAVE TIME.

## H. DUNSHEATH &amp; CO.,

Makers of Every Description of  
 STEEL MARKS, DIES, LETTERS, FIGURES, BRASS  
 STAMPS AND IRON BRANDS.

Seals, Brass, Tin and Zinc Labels, Time Checks, Stencil  
 Plates, Brass Name Plates, Rubber Stamps, &c.

**30, ARUNDEL STREET, SHEFFIELD.**

## METRIC BOLTS &amp; NUTS (5 m/m to 8 m/m).

Stock Lists on Application.

## CASHMORE BROS.,

TELEPHONE: **Zota** HILDRETH ST.,  
 415 BATTERSEA **Works** BALHAM, S.W.

Screw-Cutting and Light Engineering. Accessories for Aircraft.  
 Electrical and Motor Trades. Brass and Iron Founders.

## P.D.V. Aircraft Company, Ltd.

All Metal Parts for Aircraft made, comprising the  
 following machine work: **Milling, Turning,**  
**Shaping, Press Work, Slotting, Drilling, Grinding and**  
**Sheet Metal Work.** Well-equipped Welding and Brazing Plant.

Enquiries to - **P.D.V. AIRCRAFT COMPANY, Ltd.,**

Offices & Works: **Princes Street, Richmond, Surrey.**

Telegrams: Asres, Richmond.

Telephone: 1681 Richmond

## Chauvière's famous Integral Propellers

HOLD ALL RECORDS; USED BY ALL  
 LEADING AVIATORS. THE BEST

Sole Proprietors for Great Britain and Colonies

**THE INTEGRAL PROPELLER CO., LTD.,**

Edgware Road, The Hyde, Hendon, N.W. 9.

Telephone—Kingsbury 104. Telegrams—"Aviprop, Hyde, London."

## EBORA PROPELLER COMPANY LTD

**Ebora**

## PROPELLERS

Contractors to the ADMIRALTY & WAR OFFICE

11 & 12 SURBITON PARK TERRACE, KINGSTON-ON-THAMES

Telephone: KINGSTON 672

Telegram: "EBORA, KINGSTON"

# SCREW-DRIVING

## RUSSELL BROTHERS, Ltd., REDDITCH

# MACHINES.

Trade **MENDINE** Mark.

## LIQUID SCOTCH GLUE

USED BY THE LEADING AEROPLANE CONSTRUCTORS.  
 MOISTURE PROOF

Write for Price List and Particulars

**MENDINE CO., 8, Arthur Street, London Bridge, E.C.**

KINDLY MENTION "THE AEROPLANE"

WHEN CORRESPONDING WITH ADVERTISERS.



## THE POOLE AVIATION CO. POOLE, DORSET.

*Contractors to H.M. Government.*

**Spares and all Parts of Machines.**

**ENQUIRIES INVITED.**

Phone: Poole 54.

Grams: Aviation, Poole.

## HEATING, DRYING AND VENTILATION.

**Kinnell's**

OF DOPE SHOPS, AERODROMES AND  
AIRCRAFT FACTORIES, &c. OF EVERY  
DESCRIPTION. List 1134 free.

**C. P. KINNELL & CO., LTD.** Phone—  
Hop 372  
65, SOUTHWARK ST., LONDON, S.E.1.

WE HAVE INVENTED

# THE

NON-EVAPORATING

# DOPE POT

ARTHUR HILL & CO.,

SHEET METAL WORKS,

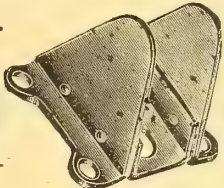
SILCHESTER ROAD,

LONDON, W.10.

Phone—1443 PARK.

## Toolmaking, Diesinking, Stamping, Presswork.

**AERO PARTS**



**WILLIAM MILLER,**  
13 $\frac{1}{2}$ , Gt. Hampton St.,  
BIRMINGHAM.

## MISCELLANEOUS ADVERTISEMENTS.

### AIRCRAFT PARTS.

**Hardwood for Aeroplanes.**—Specially Selected air-dried timber as supplied to leading constructors in Britain and the Continent. Silver Spruce, Ash, Poplar, Hickory and Ash Skids; Three-ply; Thin Cedar and Mahogany for Floats; Walnut for Propellers.—William Mallinson and Sons, Ltd., Hackney Road, Phone, 3845 Central, 4770 Wall.

**Tapes, Webs, Cords and Threads** in all qualities, suitable for Aircraft Work. Delivery from stock.—John MacLennan and Co., 30, Newgate Street, London, E.C.1. (See Advertisement Page iv of Cover and Buyers' Guide).

**Aeroplane Seats** to any drawing or specification. Prompt deliveries.—F. C. Chappell, Cane Works, 9, Fisher Street, Nottingham.

**Aeroplane Seats.** We can give quick delivery of cane seats, A.G.S. 264 or other patterns, guaranteed pass inspection. Write us for anything required in cane work.—The Willowbrook Company, Leicester

**A.G.S. Fittings,** all brass and gunmetal series supplied. Petrol cocks, etc.—H. Burton and Co., Ltd., Cannon Works, Willesden, N.W.10.

### MISCELLANEOUS.

**Nerve Failure** speedily cured, self-consciousness eliminated, concentration increased, and confidence restored by sympathetic hypnotic suggestion. Interesting explanatory booklet post free.—Robert McAllan, Regent House, Regent Street, W.1.

**Make Money by Writing.**—£50 Prize. Send postage (2d.) for particulars and copy of "How to Earn Money while Learning, How to write for Newspapers and Magazines." Practical and comprehensive Correspondence Courses—Fiction and Articles, etc., Expert Literary Directors. Constructive criticism. Beginners taught how to make work saleable. Exceptional testimonials. Address: "EDITORIAL" (Dept. A), 22, Chancery Lane, London, W.C.2.

### WANTED.

**Wanted Woodwork** for aeroplanes, very large up-to-date factory, fully equipped with latest machines; any class of aircraft work undertaken; prompt deliveries; best work.—Apply Box 3030, THE AEROPLANE, 166, Piccadilly, W.1.

**Engineering Firm** with well-equipped machine shops, now engaged on munitions, solicits inquiries for all classes of turning, drilling, grinding, milling, fitting, etc. Aircraft fittings, also copper pipe work, a speciality. Correspondence with a view to post-war business especially invited.—The Lankester Engineering Co., 39, Eden Street, Kingston-on-Thames.

**Glue,** strong, suitable for joinery work, Several tons in all.—"J.", Box 126, Benson's, Kingsway Hall, W.C.2.

**Wire and Cut Nails and Box Hooping,** or  $\frac{1}{2}$ -in. and  $\frac{3}{4}$ -in. thin strip iron. Large quantities wanted ex. stock, for cash.—"C.", Box 125, Benson's, Kingsway Hall, W.C.2.

**Deperdussin.**—Wanted Photos of 25, 28, and 35 H.P. Depts. of 4912.—Box No. 3343, THE AEROPLANE, 166, Piccadilly, W.1.

**Wanted,** repetition oxy-acetylene welding, bracket work, etc., by Lancashire firm. Proprietor discharged.—Apply, "B. C.", 78, THE AEROPLANE, 166, Piccadilly, W.1.

**Send us your inquiries** for machine work of all kinds, which we can carry out in our own shops, capstans and centre lathes suitable for small turning and repetition work. Quotation by return. Prompt deliveries.—Apply, Aeroplane General Sundries, Ltd., Fulwood House, Holborn, W.C.

**Piercing and Blanking Dies** for aeroplane sheet metal parts. Quick deliveries, reasonable charges. Light punching work also undertaken.—The Remus Co., Ltd., Letchworth.

### AUCTION.

At the Sawmills of Edward Spencer and Co., Longfellow Road, Mile End, E.—Messrs. Fuller, Horsey, Sons and Cassell, having disposed of the freehold, will Sell by Auction, in lots, on the Premises, on Tuesday, Feb. 19th, at 10.30 o'clock precisely, modern

### WOODWORKING MACHINERY

including nine saw benches up to 45-ins., two with R. and F. spindles, two 24-in. panel planers, 18 by 6 double-side planer, 4-in. by 11-in. four-cutter moulding machine, 12-in. Lightning planer, 36-in. band saw machine, vertical spindle reversing moulding machine, plain ditto, chain mortising machine, saw sharpener, two tenoning machines, one 4-in. by 14-in. and one 6-in. by 18-in., double deal frames, pendulum and other crosscut saws, 36-in. Invincible sand-papering machine, three double-disc ditto belt sander, two multiple spindle boring machines, three moulding and recessing machines, dimension saw bench, double spindle and multiple ditto, mortising and boring machines, two dovetailing machines, tonguing, grooving, and rabbetting machines, two Prouty platen and one rotary box printing machines, branding machine, 15-in. overhand planing and jointing machine, 7-in. ditto, lock-cornering machine, moulding and plane iron girders, sheet iron punching and shearing machines, tinsmiths' tools, sensitive drill, stock of WELL-

### SEASONED TIMBER and HARDWOOD,

general stores, including a large quantity of nails, glue, hoop iron, etc.

May be viewed by orders, and catalogues had of Messrs. FULLER, HORSEY, and CO., Mechanical Auctioneers and Valuers, 133, High Holborn, W.C.1.



## MISCELLANEOUS ADVERTISEMENTS.

**SPECIAL PREPAID RATE:** 18 words 1/6; Situations Wanted ONLY, 18 words 1/-; 1d. per word after. **TRADE ADVERTISEMENTS,** in these columns, 3 lines 3/-; 10d. per line after. Public Announcements, Legal Notices, Auctions, Contracts, etc., 1/6 per line. For the convenience of Advertisers, replies can be received at the offices of "THE AEROPLANE" 166, Piccadilly, London, W.1.

## PATENTS.

**PAGE & ROWLINSON,** Chartered Patent Agents (Consulting Engineer, Mr. S. E. Page, A.M.Inst.C.E.), 27, Chancery Lane, London, W.C. Tel. 332 Central.

**Henry Skerrett,** Chartered Patent Agent, 24, Temple Row, Birmingham.—Patents, trade marks, and designs.

**Inventors advised free.** Write for booklet.—King's Patent Agency, Ltd., 165, Queen Victoria Street, London. 30 years' references.

**Stanley, Popplewell and Co.,** Patent Agents and Consulting Engineers. Applications for Patents attended to in all countries.—38, Chancery Lane, W.C. Telephone: 1763 Central. Circular free.

## SITUATIONS VACANT.

**Wanted, Sheet Metal Workers, fitters, and turner-fitters, must be first-class men.** No one on Government work or residing more than ten miles away need apply to:—Harley Works, Beckton Road, Plaistow, E.16.

**Wanted at once in large progressive aircraft factory, experienced and energetic erection shop foreman, used to tactful handling of men.** No one on Government work need apply.—Applications must be made through nearest Employment Exchange, mentioning this paper and Box No. 3292.

**Good Engineering Draughtsmen** wanted with some experience of aeronautical work preferred, but not essential. Those on Government work need not apply.—Write, stating experience and salary required, to nearest Employment Exchange, mentioning this paper and No. 3328.

**First-class Assistant Draughtsman** required for aeroplane work. Good mechanical experience essential. No one on Government work need apply.—State experience and salary required to nearest Employment Exchange, mentioning this paper and No. 3327.

**Two Draughtsmen** required, capable and up-to-date in engineering works, neighbourhood of Bristol, manufacturing aero engines. Applicants not already engaged on Government work should apply to nearest Employment Exchange, mentioning this paper and No. 3348.

**Woodworking Foreman** required, experienced in wing making. No one on Government work need apply.—Apply, giving record and wages required, to nearest Employment Exchange, mentioning this paper and No. 3357.

**A Large Aircraft Firm,** manufacturing machines of their own design, require the services of a number of really good mechanical draughtsmen who have had a thorough theoretical and practical training, as well as some experience, in aeroplane design and construction. Opportunities above the average exist for men to whom the above description applies. Applicants must live in London, and not be engaged on Government work, and they should write, stating age, past experience, and salary required, to Box No. 3354, THE AEROPLANE, 166, Piccadilly, W.1.

**Accountant** for accounts, wages, and costs. Aircraft experience if possible. Smart and intelligent Office Boy. Purchaser with aircraft experience. Timekeeper with previous experience; suit discharged soldier. Twelve Joiners, with previous aircraft experience. No one already engaged on war work or residing more than 10 miles away need apply.—The Ruffy, Arnell, and Baumann Aviation Co., Ltd., Noel Road, Acton, W.3.

**Fredk. Sage and Co., Ltd.,** Baldwin's Gardens, Gray's Inn Road, W.C.1, require a number of good joiners for Government work. No one already engaged on Government work or residing more than 10 miles away need apply.

**Capable Draughtsmen** required for experimental aeroplane work in Willesden district. Men with shop experience preferred. No one on Government work or residing more than 10 miles away need apply.—Box No. 3355, THE AEROPLANE, 166, Piccadilly, W.1.

**Wanted** capable Assistant Foreman to take charge of turners, machinists, and fitters on night shift in aircraft factory. Improving position for the right man. Men on Government work need not apply.—Apply, stating experience, age, and wages required, to your nearest Employment Exchange, mentioning this paper and Box 3345.

**Rate Fixer** required by an engineering firm manufacturing aero engines in the neighbourhood of Bristol. One used to time study and process on up-to-date methods of machining and fitting. Good salary to right man. Applications from those already on Government work cannot be entertained.—Apply, nearest Employment Exchange, mentioning this paper and No. 3347.

## RADIATOR AND SHEET METAL WORK UNION WORKMEN (BEST RATES PAID) WANTED

No one already on Government work or  
residing more than ten miles away  
will be engaged.

Apply—

**GALLAY RADIATOR CO., LTD.**  
198, Gt. Portland Street, W.3

**Fifteen First-rate Fitters,** first-rate pay. Must have a thorough knowledge of aeroplane fitting. No other need apply. No person already engaged on Government work, or residing more than 10 miles away need apply.—Box No. 3346, THE AEROPLANE, 166, Piccadilly, W.1.

**Wanted Ship's Draughtsman** for flying boat work, used to wood boats and launches, able to undertake calculations, experience in aircraft an advantage. No one on Government work need apply.—State age, salary expected, and give particulars of experience to your nearest Employment Exchange, mentioning this paper and No. 3350.

**Cabinetmakers, Coach Builders, Piano Case Makers, Carpenters, and Joiners** required for aeroplane factory on South Coast. No person already engaged on Government work need apply.—Apply nearest Employment Exchange, mentioning this paper and No. 3351.

**Stores Cost and Records Clerk.**—Wanted by firm of aircraft builders, Southern district. Must be thoroughly efficient and methodical. Used to aircraft, engineering, or hardware trades. Stores routine. Six o'clock man. Ineligible for military service. One who knows his job and would render good service is required. No one on Government work need apply.—Write, with full particulars of experience, and state salary required to nearest Employment Exchange, mentioning this paper and No. 3310.

**Aeroplane Cabinetmakers, Coachbuilders, Piano Case Makers, Carpenters and Joiners,** with experience of aeroplane work, or men desirous of obtaining aeroplane work, required in Tottenham district. No person already engaged on Government work or residing more than 10 miles away need apply.—Apply by letter to Box 101, W. H. Smith and Son, Kingsway, W.C.2.

## SITUATIONS WANTED.

**Progress, Production, Records, etc.,** responsible position required in aircraft factory. Will undertake to organise department upon sound modern lines.—Box No. 3309, THE AEROPLANE, 166, Piccadilly, W.1.

**Works Manager,** or position of trust, 37, practical engineer, invaluable experience both aeroplanes and seaplanes. Tactful, energetic, methodical organiser, accustomed to latest service methods and capable of economically increasing production.—Box 3284, THE AEROPLANE, 166, Piccadilly, W.1.

**Works Manager,** disengaged, requires similar position in aircraft factory. Good practical man and splendid organiser. Moderate salary and commission on production.—Write, Box 3319, THE AEROPLANE, 166, Piccadilly, W.1.

**Aero-engine Manufacturer (A.F.Ae.S.)** is open for engagement. Specialist in: (1) Mass production of accurate components, (2) gauge and tool manufacture, (3) machine tool design, (4) scientific heat treatment of high tensile steels, (5) lay-out of plant for aero engine manufacture. Capable controller of labour. Energetic and keen for production. Temporary or permanent engagement.—Box No. 3314, THE AEROPLANE, 166, Piccadilly, W.1.

**Buyer,** 11 years' experience engineering and electrical trades, desires permanency with progressive firm; fond of hard work; expert organiser, and strict disciplinarian; capable of economically maintaining production.—Box No. 3344, THE AEROPLANE, 166, Piccadilly, W.1.

**Chief Inspector,** first-class experience on aeroplanes, seaplanes, and flying boats, desires position with firm building complete machines. Well up in A.I.D. requirements.—Box No. 3352, THE AEROPLANE, 166, Piccadilly, W.1.

**Charge Hand Erector** wants berth. Well up in all parts.—References, Box No. 3349, THE AEROPLANE, 166, Piccadilly, W.1.

**Efficient Engineer,** desiring change, solicits post with provincial firm. Capable producer and sound knowledge of requirements for aircraft work. Present post, general foreman. Previously metal department manager, works inspector. Exceptional circumstances. Replies confidential.—Box No. 3356, THE AEROPLANE, 166, Piccadilly, W.1.

**Works Manager,** thorough knowledge of latest aeroplane and seaplane construction, desires position with first-class firm. Excellent organiser, latest methods of production.—Box No. 3353, THE AEROPLANE, 166, Piccadilly, W.1.

## AVIATION

## AVIATION INSTRUCTION

on up-to-date lines, by a qualified Engineer in Aeronautics. Demonstrations from complete set of parts, and sectioned models.

**Send for Prospectus No.1.A.,  
THE MOTOR TRAINING INSTITUTE  
LTD.,  
10, Heddon Street, Regent Street, W.1.**

## FOR SALE.

**Sixty h.p. 4-cylinder Aeroplane Engine,** water-cooled heads, mechanical overhead valves, £40. Exchange rotary radial for experiment.—Gibson, Crayford.

## ENGINEERING.

**British School of Aeronautics.**—Aircraft Engineering Course; Aero Design; Aero Construction; Aero Draughtsmanship; Mechanical Engineering.—Pennington's, 254, Oxford Road, Manchester.



# Clipper Time Recorders

## System "B."

The "IN" and "OUT" time is recorded on the card, also the time when jobs are changed.

The **TIME on the Job** is cast out at the side of card and the total hours entered in the Job No. column under the Job number.

**Unfinished Jobs** are entered at the foot with Job number and the total hours worked up to the week-end under column headed "Carried Forward," and transferred to the next week's time card in the column "Brought Forward," any time worked on this job during the second week is entered in the column, "Time for this Week." If the job is completed during the second week, the total is added and entered in the "Jobs Finished" column. If the job is not completed, the total is entered in the column "Carried Forward," which will in turn be entered on the third week's time card.

**STANDING ORDER NUMBERS** for constantly recurring Non-Productive Jobs are represented on the card, e.g. K.31 Grinding Tools; E.53 Making a New Lathe Tool.

CHECK No. 315.		WEEKLY TIME CARD. Week ending 18 Aug 1916 Name Tho. Johnson			
Job No.	IN—ON	OUT—OFF			
1360	5 59 SA 8 29 SA	12 01 SS			5½
	5 59 M 8 29 M 1 29 Z	5 02 M			9½
	5 59 TU 8 29 TU 1 29 Z	5 01 Z			9½
32 H75	5 59 W 8 29 W 1 29 Z	3 00 Z	32h	7½	
	3 00 Z	5 01 Z		2	9½
1570	6 00 TH 8 30 TH 1 29 Z	5 00 Z	11½	9½	9½
K.31	6 00 T	7 00 F		1	
E.53	7 00 F 8 29 F	10 00 F		2½	
1820	10 00 F 1 30 T	4 00 T		5	
1469	4 00 T	5 00 T		1	9½
TOTAL FOR WEEK					53
Job No.	Brought Forward	This Week	Jobs Finished	Carried Forward	
1360	16	32	48		
1469				1	

COMBINED "TIME AND JOB CARD"

For Recording COMPLETE LABOUR COST.

CATALOGUE FREE ON APPLICATION GIVING OTHER SYSTEMS.

# THE GLEDHILL-BROOK TIME RECORDERS LIMITED.

26, VICTORIA STREET, LONDON, S.W.  
Tel. Vict. 1310.

44, HILL STREET, BIRMINGHAM.  
Tel. Mid. 2086.

EMPIRE WORKS, HUDDERSFIELD.  
Tel. 1069.



# WYCOMBE AIRCRAFT CONSTRUCTORS, LIMITED.

==  
HIGH WYCOMBE,  
BUCKS.

==  
Telephones : High Wycombe 84 (Stores : High Wycombe 120).  
Telegrams : "Aircraft, High Wycombe."

CONTRACTORS TO THE ADMIRALTY AND AIR MINISTRY.

# SHORT BROTHERS, Aeroplane and Seaplane Works, ROCHESTER, KENT,

— AND —

# Aircraft Works & Flying Grounds, — BEDFORD. —

Telephones :—

627 CHATHAM  
261 AND 262 BEDFORD.  
788 BATTERSEA.



Telegraphic Addresses :

"SEAPLANES," ROCHESTER.  
"SHORTS," BEDFORD.  
"BALLOONING," LONDON.

London Office : WHITEHALL HOUSE, 29/30, CHARING CROSS, S.W. 1.

Telephone : 378 REGENT.

Telegrams : "TESTED, PHONE, LONDON."

EDITORIAL AND ADVERTISEMENT OFFICES, 166, PICCADILLY, W.1.

Printed for THE AEROPLANE AND GENERAL PUBLISHING CO., LTD., by BONNER & CO., The Chancery Lane Press, Rolls Passage, London; and Published by THE ROLLS HOUSE PUBLISHING COMPANY, LTD., at Rolls House, Breems Buildings, London.



# THE AEROPLANE

WEDNESDAY, FEB 20 1918.

Edited by  
C. G. Grey

Vol. XIV, No. 8

THREEPENCE WEEKLY

[Registered at the G.P.O.  
as a Newspaper.]

## THE NORMAN THOMPSON FLIGHT CO. Ltd.

ESTABLISHED 1909

Telegrams—SOARING, BOGNOR  
ENTIFLYTE CHARLES, LONDON

Works—MIDDLETON, BOGNOR

CONTRACTORS TO THE ADMIRALTY

Telephones—BOGNOR 48. GERRARD 7385

London Office—  
DEWAR HOUSE, 11, HAYMARKET, S.W.1.

DESIGNERS AND MANUFACTURERS OF FLYING BOATS AND LAND PLANES

**Auster** FOR **Aero-shields**  
LONDON. BIRMINGHAM

**BEARDMORE** AERO  
ENGINES

**TITANINE**  
NON-POISONOUS  
**DOPE**  
SEE ADVERT. INSIDE.

**ACCLES & POLLOCK, LIMITED**

WELDLESS STEEL TUBES — OLDBURY, BIRMINGHAM.

**TRIPLEX** Safety **GLASS**  
See Advt. inside



# . THE . ENGINEERING TIMBER CO. Ltd.

11, Victoria Street, London, S.W.

J. E. HUSON, Managing Director.

Telephone: Victoria—5073, 4210

Telegrams: Entikosil, Vic. London.

SILVER SPRUCE

ASH

WEST VIRGINIAN SPRUCE

WALNUT

MAHOGANY

GLASGOW:

67, HOPE STREET.

Telephone: Central 3273.

Telegraphic Address: Entikosil, Glasgow.

PARIS AGENCY:

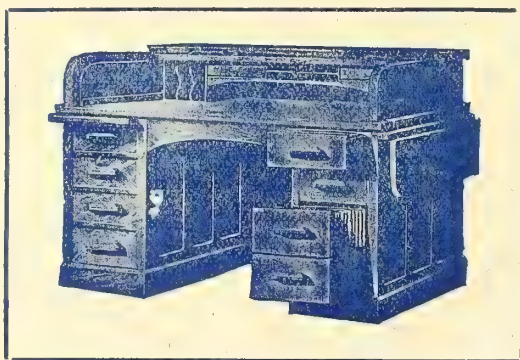
6, RUE DE HAVRE, PARIS.

## Factory & Office Furniture

LARGEST STOCK FOR IMMEDIATE DELIVERY.

(NEW AND SECOND-HAND)

SPECIALITÉ



SAFES.

### COOKE'S (FINSBURY) LTD.

INCORPORATING

The FINSBURY OFFICE  
FURNISHING Coy.

&


J. W. COOKE  
& Coy.

FINSBURY PAVEMENT HOUSE, LONDON, E.C.2.

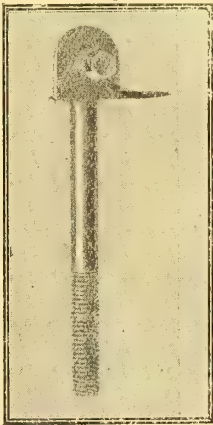
Telephones: LONDON WALL } 6179.  
573.

See Telephone Book relating to our Shopfitting, Signs and other Departments.

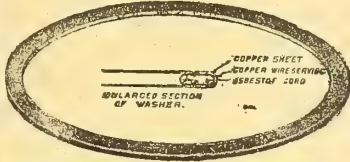




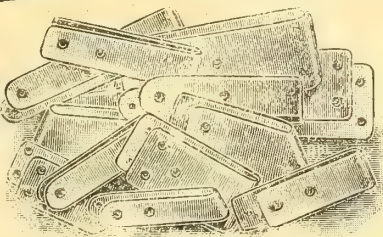
**BROWN BROTHERS LTD.**  
The Largest Motor Accessories House in the World



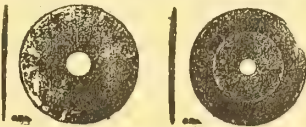
6493      9065  
**HINGE PINS**  
95s. per gross.  
IMMEDIATE DELIVERIES.




**C. & A. WASHERS** for Gnome Engine Exhaust Valve Seats.  
All types of C. & A. Washers supplied.  
**7m Rubber Covered Ignition Cable**  
(Passed A.I.D.). SUPPLIED FROM STOCK.



**ALUMINIUM CLIPS.**  
All types supplied to Drawing.

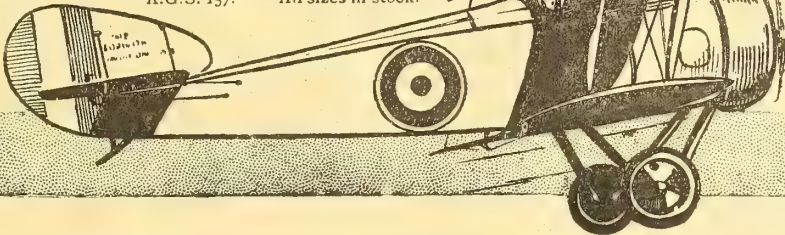


**DURALUMIN WASHERS.**  
A.G.S. 157. All sizes in stock.



**Fork Ends.**  
11684/B.  
10,000 pairs from stock.

**Types of British Aircraft**



Send Three Stamps for Portfolio of Illustrations of "Type of British Aircraft."

**The Sopwith Camel.**

**Metal Fittings a Speciality.**

**The Aero Mechanical Co., Ltd.**

CONTRACTORS TO THE AIR BOARD.

60-66, ROCHESTER ROW, LONDON, S.W.1.

Telephone: Vic. 7570 (3 lines).

Managing Directors:  
E. Salomon J. Fogels n

Complete Fittings and Dies in Stock for latest D.H. Machines; also most of the Fittings for other D.H. Machines and Handley-Page.

**Our reputation has been built up by our ability to effect deliveries right up to time.**



Are YOU interested in Flying? If so, why are YOU not taking

**The Nottingham Flying and  
Correspondence Schools, Ltd., Course?**

The Imperial Flying Service Pilots say it is the Best in the Country.

Write for Particulars and Illustrated Book issued Free.

**CASTLE MEADOW ROAD, NOTTINGHAM.**

'Phone 5766.

**THE MIDLAND MOTOR CYLINDER CO. L<sup>TD</sup>**

**SMETHWICK**

TELEPHONE—289 SMETHWICK

**N<sup>R</sup> BIRMINGHAM**

TELEGRAMS—RAFWORK, SMETHWICK

**SPECIALISING IN**

**AERO ENGINE CYLINDERS IN IRON AND  
ALUMINIUM TO PASS ALL GOVT. TESTS**

WE HAVE THE LARGEST OUTPUT OF AERO-ENGINE  
CYLINDER CASTINGS OF ANY BRITISH MAKER

Registered Trade Mark



Non-Inflammable Transparent Celluloid.

**LONDON LABEL CO., Ltd.,**

*Contractors to H.M. Government.*

**HARLEY WORKS, BECKTON RD., LONDON, E.**

**WIND SHIELDS  
MAP COVERS  
OBSERVATION PANELS  
*Prompt deliveries of every type.*  
LUMINOUS PRINTING**

Labels for Instrument boards, &c., for night work.

**Any special article made up to templates or drawings  
and delivered by return.**

**N.B.—Nonlamoid is very much lighter and easier to work than  
any kind of glass, also it will stand much harder usage.**

**“NOVELLON” DOPE  
AND AEROPLANE VARNISH.  
CELLULOSE ACETATE & CHEMICALS**

**BRITISH CELLULOSE & CHEMICAL MANF'G.  
COMPANY, LIMITED.**

Telegrams:

Cellutate, London.

**8, WATERLOO PLACE, S.W.1.**

'Phone: Regent 4045.

**Works: Spondon, Derby; and Maybury Gardens, High Road, Willesden Green, N.W.10.**

(Telephone: Willesden 2380.)

KINDLY MENTION “THE AEROPLANE” WHEN CORRESPONDING WITH ADVERTISERS.



# Repetition Specialization

The desire to "do the job complete" has, during the great upheaval of the last three years, had to give way to the necessity of doing it rapidly. Output, and still greater output, has been the one essential, and manufacturers have had the value of specialization more thoroughly demonstrated than ever in the history of British Trade. That condition will remain, and with our widened experience, reorganised factories and unequalled facilities for the production of **repetition work** invite your enquiries in this direction.

## SUCKLING

5, KINGSWAY HOUSE, ALBION STREET, BIRMINGHAM.  
LONDON :: :: MORLEY HOUSE, HOLBORN VIADUCT, E.C.1.

## IMPORTANT NOTICE

TO ALL

### Engineering Firms and Aircraft Manufacturers.

We beg to call your attention to the following work that we specialise in, and solicit your valued enquiries. We can quote prices and deliveries that will be attractive to you for all classes of work, or to any special specification and requirements for all work in connection with Ministry, Admiralty, or Air Board.

**DROP STAMPINGS & FORGINGS FOR ALL PURPOSES, IN STEEL OR IRON, BRASS OR BRONZE (HOT STAMPINGS).**

**SAND OR DIE CASTINGS IN ALL METALS.**

**SHEET METAL PRESSINGS.**

**SOFT GREY IRON CASTINGS; MALLEABLE IRON & CAST STEEL CASTINGS. WOOD WHEELS AXLES; SWINGLE TREES; CHAIN WORK; LEATHER WORK, AND GENERAL IRON WORK FOR ALL TYPES GENERAL SERVICE VEHICLES. Also**

**COMPONENT PARTS in Steel Forgings or Stampings for Aeroplane Work, including A.G.S. No. 158 Shackles; Steel Stampings, sizes A, B, C, D, E & F.**

**THE ANGER MANUFACTURING & SUPPLY COMPANY, LTD.**  
**PRESTON, Lancashire.**

Telephone : 1033.

Telegrams : "Brakjuster, Preston."

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





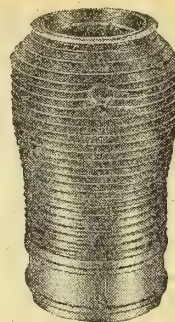
THE  
Beverley Engineering Works

**Aeroplane Cylinders**

Clerget

Le Rhône

Gnome



WILLOW AVENUE, BARNES, LONDON.

'Phone: Putney 478

**AIRSHIPS, LTD.**

**Manufacturers of Airships and Kite-Balloons**

**Contractors to the Admiralty**

London Office:  
47, VICTORIA ST., S.W.

Works:  
HIGH ST., MERTON, and HENDON

**A.G.S. WASHERS**

Wire  
Work.

**THIMBLES**

Turn Buttons.  
Eyelets.  
Washers.

**UNION NUTS & NIPPLES.**

Tel.: 550 Central  
Tel. Ad.: BRISK, BHAM.

**W. H. BRISCOE & Co., Ltd.,**  
51, 52, 53, PARK STREET,  
BIRMINGHAM.

**THE AIRCRAFT CONSTRUCTION CO.**

EVERY DESCRIPTION OF METAL COMPONENTS.

**Immediate Delivery of SE SUMPS.**

**HARLEY AEROPLANE WORKS, Beckton Rd., E.16**

Telegrams: "Aercracons," Canning, London.

'Phone: East 1300.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



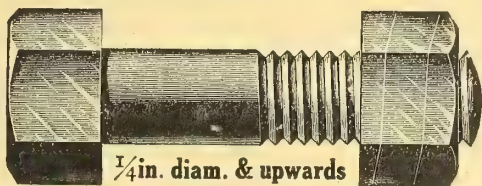


## CASTINGS

Aluminium Cylinders, Crankcases.  
 Cylinders and Pistons in Sterling Iron.  
 Bronzes 42 Tons High-tension, Phosphor  
 — FOR —  
 Aircraft and Motor Vehicles  
 — TO —  
 All Government Specifications

**Sterling Metals, Ltd.**  
 WIRE "STERMET" COVENTRY  
 PHONE COVENTRY 881 **Coventry.**

## BRIGHT BOLTS & NUTS



1/4 in. diam. & upwards

(Suitable for Every Description of Engineering Work)

**QUALITY, ACCURACY AND FINISH GUARANTEED**

### THE "HELICOID" LOCK-NUT

(THE FINEST LOCK-NUT IN THE WORLD.)

This nut will remain secure, no matter how great the vibration may be—in fact vibration actually tightens the grip.

(made from 3/16 in.  
 to 2 1/2 in.)



(sample nut & prices  
 on application)

We also manufacture Wrought Iron Railing and Gates, etc.

**BAYLISS, JONES & BAYLISS,**  
 LTD.  
**WOLVERHAMPTON.**

London Offices: 139/141, CANNON ST., E.C.4.

## TIMBER

**SILVER SPRUCE**

**ENGLISH ASH**

**WALNUT & MAHOGANY.**

**JOSEPH OWEN & SONS**  
 Limited

**Borough Saw Mills,  
 LONDON, S.E.1.**

Telephone: Hop 3811. Telegrams: "Bucheron Sedist."



Contractors to H.M. Government.

# SWIFT AVIATION CO.

Dolphin Engine Plates in Stock,  
Complete Sets.

*Speciality Sopwith Spares.*

## KINGSTON

PHONE—  
762 KINGSTON

GRAMS—  
"SWIFT, KINGSTON"

**AIRCRAFT DEPARTMENT**



THE WORLD'S LARGEST MANUFACTURERS OF ALL KINDS OF ENGRAVED METAL GOODS.

**British Metal (Kingston) Ltd.**  
*The Factory.*  
Kingston-on-Thames.

**DIALS & INSTRUCTION PLATES**  
MADE IN ANY METALS,  
IVORY, IVOROID, BONE, ETC.  
ANY QUANTITIES, WORDING, DESIGN,  
SIZE, SHAPE OR COLOURS.

. . . . .

**COMPLETE SHEET METAL  
AIRCRAFT COMPONENTS**  
RIVETED, SWEATED, BRAZED OR WELDED.  
R.E., F.E.B. & D, B.E.C-D-E,  
SE, DE H.  
RESIDENT A.I.D. EXAMINER.

# LEARN TO FLY

— AT —

## Bournemouth.

— THE —

**LARGEST AND MOST UP-TO-DATE  
CIVILIAN SCHOOL IN ENGLAND.**

*Immediate Vacancies.*

*Run under Rules approved by the Royal Aero Club.*

**RAPID TUITION.**

43 Caudron Service Bip'anes (Solo & Dual Control).

**SPECIAL TRAINING**

for Pupils intending to enter the R.F.C. or R.N.A.S.

**APPLY:**

**Bournemouth Aviation Co., Ltd.,**  
AERODROME, BOURNEMOUTH. (Phone 1160).

## HIGH-CLASS ALUMINIUM CASTINGS

**FOR ALL TRADES.**

We Specialise in Aluminium Cylinders and  
General Aero and Motor Engine Castings,

## CAST IRON CYLINDERS

Water and Air-cooled for Aero & Motor Engines

ALL THE ABOVE CASTINGS  
TO GOVERNMENT SPECIFICATION.

**WILLIAM MILLS, LTD.,**

Atlas Works :: Grove Street,

**BIRMINGHAM.**

ALUMINIUM AND IRON FOUNDERS.





# STEEL STAMPS

OF EVERY DESCRIPTION.

Steel Letters and Figures, Stencil Plates,  
Branding Irons.

**JOHN MEERLOO & SONS,**

*Contractors to His Majesty's Government,*  
Cleveland Works, Cleveland Street, Mile End,  
London, E.1.

Phone:  
EAST 3331 (2 lines).

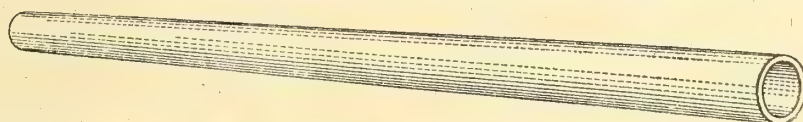
Telegrams:  
"Dayhur, Phone, London."



STEEL HAND PUNCH



Patent No. 4704/15.



## McGRUER SPARS

are THE ACME of  
STRENGTH and LIGHTNESS

Particulars from:—

**McGRUER BENTWOOD HOLLOW SPAR Co.,**  
Commercial Wharf, Lambeth, LONDON, S.E.1.

TYPE C.C.A.

## TANGENT

TYPE C.C.B.

Self-Feeding

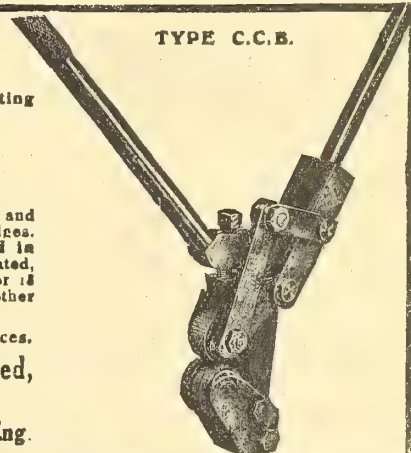
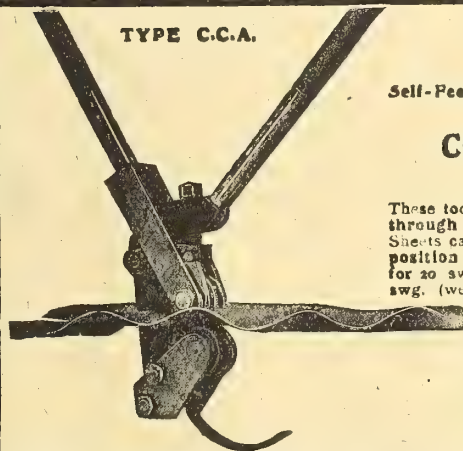
HAND TOOLS  
FOR CUTTING

Non-Distorting

**CORRUGATED SHEETS**  
PATENT.

These tools will cut sheets on any angle, limited curves and through the centre with no distortion of cut edges. Sheets can be cut to required shape when being fixed in position on the job. Made in two styles, as illustrated, for 20 swg. (weight 5 lbs.), with compound leverage for 18 swg. (weight 6 1/2 lbs.). Cuts 100 to 200 faster than any other hand method.

Write for Illustrated Pamphlet and Prices.  
**Montgomery, Smith & Co., Limited,**  
Patentees and Manufacturers,  
Tangent Wks., Keynham, Somerset, Eng.



# PLYWOOD

In all Thicknesses and Qualities.

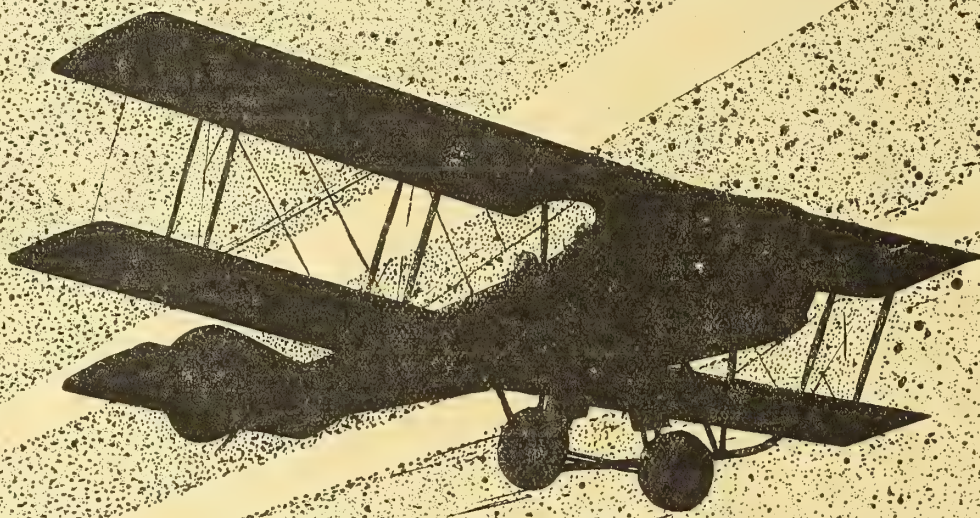
**SIBERIAN & GENERAL TRADING CO., Ltd.,**  
1-3, Leonard Street, City Road, LONDON, E.C.2.

Telegraphic Address: "Wolosey, Finsquare, London."

Telephone: London Wall 3577.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





# AVRO

## NOTHING BETTER

### A.V. ROE & CO. LTD.

TELEGRAMS:  
TRIPLANE

MANCHESTER

TELEPHONE  
CITY 8530 &  
8531



# The AEROPLANE

The Editorial and Advertising Offices of "The Aeroplane" are at 166, Piccadilly, London W.1.  
 Telegraphic Address: "Aileron, London."  
 Telephone: Mayfair, 5407.  
 Accounts, and all correspondence relating thereto, should be sent to the Registered Offices of  
 The Aeroplane and General Publishing Co., Ltd., Rolls House, Breems Buildings, E.C.4.  
 Subscription Rates, post free: Home, 3 months, 8s. 10d. 6 months, 7s. 7d.; 12 months, 15s. 2d.  
 Foreign, 3 months, 9s. 0d.; 6 months, 10s. 0d.; 12 months, 20s. 0d.  
 U.S.A., 1 Year, \$5.20c. Canada, 1 Year, \$4.70c.

## ON A VARIETY OF THINGS.

### THE AIR FORCE.

It seems that we are like to be condemned next week to another indigestible mess of Parliamentary pottage, seeing that the Air Force Estimates are to be introduced in the House of Commons on Thursday of this week, and it will be necessary, for historical reasons, to record most of the things then said.

Presumably the Estimates themselves will not contain any figures bearing on the subject, for actual figures would give information to the enemy, and therefore the vote will merely be for some purely symbolic sum, about as useful for purposes of practical calculation as are the curious symbols used by high-class aeronautical scientists. But the motion to pass the Estimates will, one expects, afford Ministers an opportunity of making official pronouncements regarding the amalgamation of the R.N.A.S. and the R.F.C. with the Air Force, and regarding whatever course is to be taken as concerns the division of the Air Force itself into Naval, Military, and Air sections. This part of the proceedings will, at any rate, be full of interest for those who are anxious to know whether and how long they are to be allowed to wear the uniforms and badges with which they have won honour and distinction in the King's Service.

Despite all the defects in its administration in the past, the R.N.A.S. has, by the individual gallantry of its personnel, deservedly borne the prefix "Royal." The R.F.C., by its efficient organisation and its high moral in the field under General Trenchard, and by its good work at home under General Brancker—now happily returned once more to the area of his former success—despite hindrances from highly placed officials, has won on its merits the place in the Army which was arrogated for it at its birth by a mere politician.

Already the two Flying Services have begun to build for themselves a tradition worthy of the two great Services which gave them birth, and it is truly lamentable that these traditions, and the *esprit de corps* which they have produced, should be lost at the bidding of a political clique. There seems now little hope of the individuality of the R.N.A.S. and of the R.F.C. being preserved, even though it would be a simple matter to assign those honourable initials to the Naval and Military branches respectively of the Air Force, while allotting the title "The Imperial Air Service" to the third, and purely aerial, branch, together with the new uniform. The I.A.S. would then start with the immense advantage of having a couple of good pace-makers to cut out its work for it.

### THE R.N.A.S. JOINS UP.

One gathers, in fact, that the R.N.A.S. officially ceased to exist some days ago, and became definitely a part of the Air Force. Apropos which one hears a delightful story. It appears that at the time on the

day when the King went to open Parliament a certain officer of one of the Flying Services, not long since returned from foreign parts, happened to be in a Government office on the processional route. Hearing the sound of martial music and the enthusiastic acclamations as the people greeted their Sovereign, he inquired innocently as to the cause of the tumult. And a weary officer in a distant corner of the office remarked languidly: "I am under the impression that it indicates that the Royal Naval Air Service has just joined the Allies."

None will appreciate the jest more than those officers of the R.N.A.S. who have done most to promote efficiency in that Service, and probably none will regret more the disappearance of the R.N.A.S. in the process of joining up with the Allies as now being carried out. At the same time it seems fairly certain that the majority of Naval officers in the R.N.A.S. would far rather that their "new Service" joined up with the Navy, so that all Naval aviators became simply Sub-Lieutenants (A.) or Lieutenants (A.) in the Navy List, than that they should become ensigns or lieutenants or captains in the Air Force, serving aboard ship as such, and junior to the despised Marines. One cannot imagine Commodores and Post-Captains and Commanders in the Royal Navy, holding those time-honoured titles by right of long Naval service, cheerfully abrogating the ranks to which they have won, and becoming Generals and Brigadiers and Lieut-Colonels in the Air Force with the same seniority as mere lads of thirty years of age or less from the R.F.C.

Even at this eleventh hour nothing would surprise one less than to see the Admiralty put its foot down, with the emphasis of the traditional flat-footed matelot, and insist on keeping its seaplanes, and flying-boats, and airships, and their personnel, all to itself as a Real Naval Air Service. It will certainly keep the airships and their matériel, even if they are manned by the Air Force, so it may just as well go the whole hog, make a proper job of it, and collar all that part of the Air Force which can never in the nature of things have anything in common with the shore-going branches.

### ALL THE DIFFERENCE.

The military aviator and the air-war aviator have at least so much in common that they will both operate from similar aerodromes on land, will both use very similar machines, will both be handled when on the ground by ordinary Army regulations and discipline, and will probably both bear the same ranks and gradings. The military aviator must necessarily be the more highly trained man, in that he must be a trained soldier who flies, as well as an aerial navigator and something of an air fighter, but except as regards reconnaissance and artillery observation duties—which need highly specialised training—the training of the



two branches must be very much alike. On the other hand, the training of the Naval aviator must be entirely different from the moment when he goes into the air for the first time, unless the Authorities are pleased to waste time and petrol in training him on a land machine and going to all the trouble and expense of teaching him all over again to fly a seaplane.

#### A MATTER OF TRAINING.

The magnificent system not long ago introduced in the R.F.C. would be, if anything, even more valuable in training Naval aviators, so it would be sheer folly to train everybody on land machines first and then teach the sea-going people afresh. Therefore the sea-going branch ought obviously, as a matter of common sense, to be a separate thing altogether. And if it is to be so, it might just as well be a part of the King's Navy, where it belongs by every law of nature. One might as well try to keep a sea-gull in a pigeon-house as try to keep the Naval aviators in the Air Force.

By all means let the land-machine squadrons of the R.N.A.S. go to form the nucleus of the Air Force, and let any R.N.A.S. and R.F.C. officers and men who want to join that Force join up. But if the highest efficiency in all three spheres of operations is to be attained and maintained, then the three sections must be kept separate. And the more separate the better, for then there will be healthy rivalry and competition and emulation.

#### THE FUNERAL ORATIONS.

However, doubtless we shall hear all about it on Thursday in the dulcet tones of Major Baird. One hopes, however, that if it is to be farewell to the R.N.A.S. and R.F.C. the task of delivering the funeral orations over those two gallant Services will be undertaken by responsible Ministers and not left to Under-Secretaries, worthy though Mr. MacPherson be of higher office. The least that the First Lord of the Admiralty and the Secretary of State for War can do is to express the regret and the admiration of their Departments in fully adequate terms. The King does not lightly bestow the title Royal on any corps, and, even in this age of the Rule of Demos, Royal Services cannot be lightly abolished.

That being that, we may now turn to minor subjects.

#### THE CONSTRUCTION OF TRAINING MACHINES.

In the ordinary course of affairs one does not pay much attention to anonymous letters, but once in a while it is worth while to do so, especially when they are of general interest and not merely abusive. It may be remembered that some time ago the question of wasting first-class labour and material in machines only intended for training purposes was discussed in these pages. That discussion produced the following letter from some person or persons unknown:—

Dear Sir,—In reference to your article "On Expectations and Anticipations," contained in the issue of your paper of Jan. 16th, 1918, we, five persons who have been handling the training machines of the British Government for some time, wish to take exception to some of your censure of the Air Board.

You say in effect that the material used for the machines in which young pilots receive their training should be made of a substitute and cheaper material, thereby endangering the lives of men who will at some near date be called to handle fighting machines against the Germans.

Why should cheaper material and poorer equipment be provided for these pilots who shall have to bear the brunt of a great deal of fighting?

Would not this substitution result in the deaths of a great many more young pilots after all?

Is it not best to give them good machines?

Trusting to see this or an answer to the same in an early edition of your good magazine.

We are most respectfully yours,

(Signed) "FIVE READERS."

Very possibly a good many other people are of the

same mind with the writers of this letter, so it seems worth while to explain further. In the first place, a substitute is not necessarily inferior to the original for its particular purpose, if properly used, though it may not be so pleasant in unessential details. For example, margarine does not taste so nice as butter—despite the advertisements—but one is quite prepared to believe that its food value is as high, and possibly it is superior as a lubricant.

Similarly substitutes for the best silver spruce may not make such a light and pretty spar as spruce, but they can be quite as strong if properly used. A substitute spar has to have more material in it, that is all, and so it comes out heavier. In a fighting machine the saving of weight is essential, for a few pounds may mean all the difference between being on top or underneath when one meets the enemy. In a training machine, if a spar of spruce-substitute comes out 7 lbs. heavier than a pure spruce spar for exactly the same strength, then one can either leave the extra weight on the ground, by taking a gallon less petrol aloft for each such spar, or one can be content with a "ceiling" at 10,000 feet or so instead of 15,000 or 20,000.

So long as a school machine will go to 7,000 or 8,000 feet, that is all that is really required of it, so it can well afford to give away some weight in order to use material which is more easily obtainable. There is not, and there never was, any question of endangering the lives of pupils or their instructors by using substitute materials or less high-class labour.

The question of cheapness does not occur. The trouble is that the best material simply does not exist in sufficient quantities at any price.

#### THE CAUSE OF THE TROUBLE.

The fact of the matter is that, thanks to the super-technicality of the Technical Department in the past, and to the super-inspection of the Aeronautical Inspection Department, the super-designing of Government designers, and the supernatural love of foreigners displayed by our Foreign Office in letting our linen go abroad, we have wasted enough timber and linen and other materials in the past three years to have built all the machines we have ever had twice over, and then to have had enough left to build the legendary American Air Fleet beloved of the daily news-sheets. The result is that now when we have determined to have the real Air Fleet for which some of us were agitating before the war—*vide* the Navy League posters of 1913—there is not enough first-class material in hand to go round.

Obviously, therefore, someone must travel second-class. Equally obviously it is the pupil under instruction who should do so.

He does not require so high a performance from his machine, so he can fly something which is heavier, though, as a matter of fact, the extra weight of guns, ammunition, and fuel carried by a war machine makes it heavier for its surface when starting from the ground than any school machine built of substitute materials is ever likely to be. Also, if his engine is not so reliable as a war engine, and if in consequence it occasionally jibs without warning, that merely provides good practice and experience for the pupil in quick action in emergencies.

#### AN OBJECT LESSON.

If anyone in the Services or in the Industry wants an education in the use of substitutes, he should go and see the German aeroplanes and parts now on view in London. Apparently the Germans have discovered how to make war aeroplanes out of sugar-boxes, and some of their detail designs might have been done by Mr. Tate—not the sugar one, but he whose first name



is Harry. Yet they stick together long enough to do their job.

It is said, purely as a rumour, that a Gotha bomber makes one voyage to London and back, and then, if it does not wreck itself in landing, it is scrapped anyhow. Anyone looking at their construction and design can well believe it. Yet they do their jobs, so why waste material and labour on producing anything better.

Nothing shows the innate thriftlessness of the Englishman better than the way in which we have handled our supply of aircraft material. When we had "material to burn"—in the American sense—we took the phrase literally and burnt the material. And now we have not got the material we squeal at having to use substitutes.

It is simply the food question all over again. When we had plenty of food in the country, overpaid workmen, who did not know how to appreciate good food when they got it, squandered it wholesale. And now they squeal and threaten to strike because they cannot get the best butter, having eaten the cows which might have produced it. Now that we are short of the best aeroplane materials, young gentlemen who took no interest in aeroplanes till they appeared as a pleasing alternative to a wet trench set up a scream about substitute materials.

As has been said, there is no reason why a machine with spruce-substitute timber and cotton fabric should be less safe than one made of the more desirable materials, provided that the substitutes are properly used. But if one wanted to be brutally frank, one might say quite truthfully that one trained pilot is worth three pupils in training, so the best materials ought naturally to go to the trained men. The mere knowledge that they were on inferior mounts might make pupils more careful.

But there is no reason why school machines built entirely of substitutes should be any weaker than war machines.

### THE GERMAN AEROPLANE EXHIBITION.

Writing of German aeroplanes reminds one to point out that it should be understood clearly that the exhibition of German aircraft and engines and of German constructional details now on view has been organised for the benefit of the Services and of the Aircraft Industry only. It is not open to the general public, and it is merely wasting time for the public to ask for tickets.

Those who are entitled to admission and who have not received passes and want them should apply as follows:—

All applicants interested professionally in the production of aircraft (*id est*, people in the Aircraft Industry, Royal Aircraft Factory, A.I.D., etc.) should apply to "The Controller of the Technical Department, The Air Ministry, Strand, W.C.2," if they cannot arrange for passes with their immediate superiors.

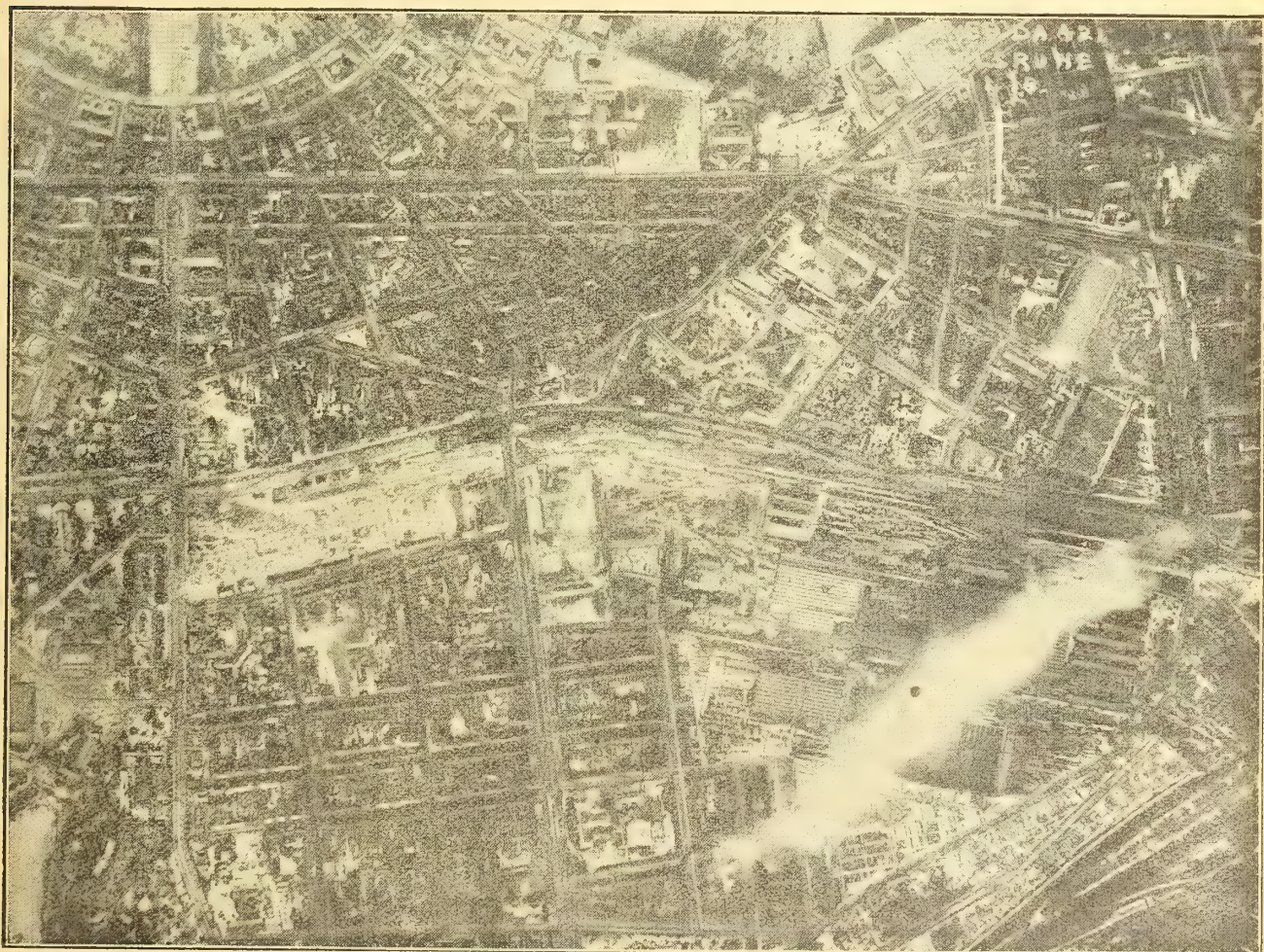
All interested professionally in the use of aircraft (*id est*, officers and men of the Navy, Army, and Air Force) should apply to "Dept. E.I.T., The Air Ministry, Strand, W.C.2."

Officers under the Training Division, R.F.C., can obtain passes from O.C. their unit.

### IN FUTURE.

It is hoped that increased accommodation for the exhibition will be available before long, and that it will then be possible to issue a larger number of passes at a time.

As already mentioned, everybody in the Aircraft In-



A REAL RAID ON GERMANY.—A photograph taken by an observer immediately after a raid on Karlsruhe.



dustry who intends to make the manufacture of aircraft their profession, and not merely a stop-gap during the abeyance of a luxury trade or a refuge from the trenches, should make a point of visiting the exhibition for their own education. There is much to be learned as to German methods of expediting production and economising labour and material, and there is quite as much to learn about what to avoid in aeroplane design and construction.

One hears with regret that some visitors have been moved to appropriate souvenirs of their visit—or to put it more plainly, petty thefts of exhibits have occurred. It seems probable that anyone caught in the act will find himself taking a holiday at His Majesty's expense. Meantime, it is to be hoped that people who are keen enough to spend their own time in going to see the show will be of sufficient mental calibre to understand that such things are simply not done—except by the best, and worst, people.

### REWARDS TO SURVIVORS.

Some people will grumble when they go to Heaven because their halos do not fit. Here is certainly one of the quaintest grouses which have come this way, though this office is by way of being the receptacle of all the complaints of everybody concerned with aeronautics. The letter comes from Torquay and reads thus:—

Sir,—May I bring to your notice the following facts, viz., that there is much hidden and suppressed discontent in the R.F.C. (Military Wing) for the following reasons: A rumour has been spread and fostered by the Press and Authorities that the officers and men of the R.F.C. do not want any awards or decorations or mention whatsoever of their brilliant and brave achievements at the Western Front.

As I am constantly in touch with our air heroes of all ranks I find the rumour has no foundations, and may be a wish of those concerned to save themselves trouble and expense.

Since the bronze stars (ribbons) have been distributed and our airmen who went out in 1914 with the "Contemptibles" have been included, the discontent is even more marked, as the officers and men who served in France and Flanders from Dec., 1914, up to June, 1915—although they have seen the hardest service of the whole war—are in a fair way of being left out altogether, and they will have no other record but their wounds.

In June, 1915, when the R.F.C. came under the Executive Command at the Front of Sir H. M. Trenchard, the Aerial Combats brought things more in the limelight, and officers and men have received awards and decorations richly merited. But the gap from 1914 to 1915, about seven months, in which the most brilliant reconnaissances were achieved, which were the forerunners of the Aerial Combats, during which over 1,500 of our heroes were killed, in action, or died of wounds (according to official records), brought the few heroic survivors no recognition whatever.

If only about 700 survived out of the first B.E.F., barely 200 would be found to have survived from the Official Army Lists from December, 1914, to June, 1915, of our Air Heroes, who went through the terrible winter of 1915, and whose services over the German Army, at its best, armed with anti-aircraft weapons against them, deserve our undying gratitude and admiration.

A D.C.M. to all the surviving mechanics and a D.S.O. to all the surviving Pilots and Observers would not bankrupt our great nation.

(Signed) A PILOT'S YOUNG WIFE.

Frankly, one believes that the dear lady is altogether wrong, but as even the most imaginative of women could not imagine all those alleged facts for herself, one is forced to believe also that at least one officer or man of the R.F.C. thinks more or less as she does. And if one thinks so, probably he has induced others to think somewhat similarly. Therefore it seems well to argue the points.

In the first place one cannot trace any rumour to the effect that the R.F.C. does not want rewards and decorations and mentions in dispatches. It is true that the great majority of the officers strongly resent members of the corps being mentioned in the vulgar news-prints of the day, none more so than the victims who are so

mentioned. Some years ago a writer in a halfpenny paper, in a violent attack on the one and only "Punch," referred to that national stimulant as a paper "once edited by gentlemen and now edited by scholars." One might paraphrase that remark and refer to the majority of daily papers to-day as "journals once staffed by journalists and now staffed by board-school bounders"—or "County Council cads," as pleases one best. The exquisite vulgarity of modern journals emphasises the natural dislike of an officer and gentleman to seeing his name in their columns except in an official communication.

But that dislike does not at all decrease the proper pride which any normally constituted man takes in having his services publicly recognised by those who are in a position to mention his name with due authority. So far from the services of the R.F.C. not having been thus recognised, one is inclined to think that, although the giving of rewards may not have been overdone in proportion to the gallantry of the deeds which won them, the Corps has received a higher proportion of rewards numerically than has any other arm of the King's Service.

The fact that every dispatch from every G.O.C. British Forces in every war area always bears witness to the collective good work of the R.F.C. is sufficient evidence that the Authorities have no intention of hiding the brilliance of the Corps under their own tin hats.

### THE 1915 VINTAGE.

So far as the 1915 vintage of the R.F.C. is concerned, it does not appear to have done too badly. It is true that those who only joined in 1915 have missed the 1914 star with its particularly obvious ribbon, but it seems highly probable that in due course there will be a 1915 medal or cross or star, to distinguish the volunteers of 1915 from the conscripts of 1916.

There are many R.F.C. people of 1914 who had no chance of going abroad till 1915 or even later, and who thus miss the 1914 star, while people who had "cushy" jobs in France in 1914 and only joined the R.F.C. a few months ago are able to promenade around with wings and a 1914 ribbon, and give the impression that they belonged to the historic "First Five Squadrons." This is a much more legitimate grievance, and when the Air Force comes into being as a separate entity the Air Council might do worse than to issue a special badge to those officers and men of both the Flying Services who flew on active service at sea or ashore during the first twelve months of the war.

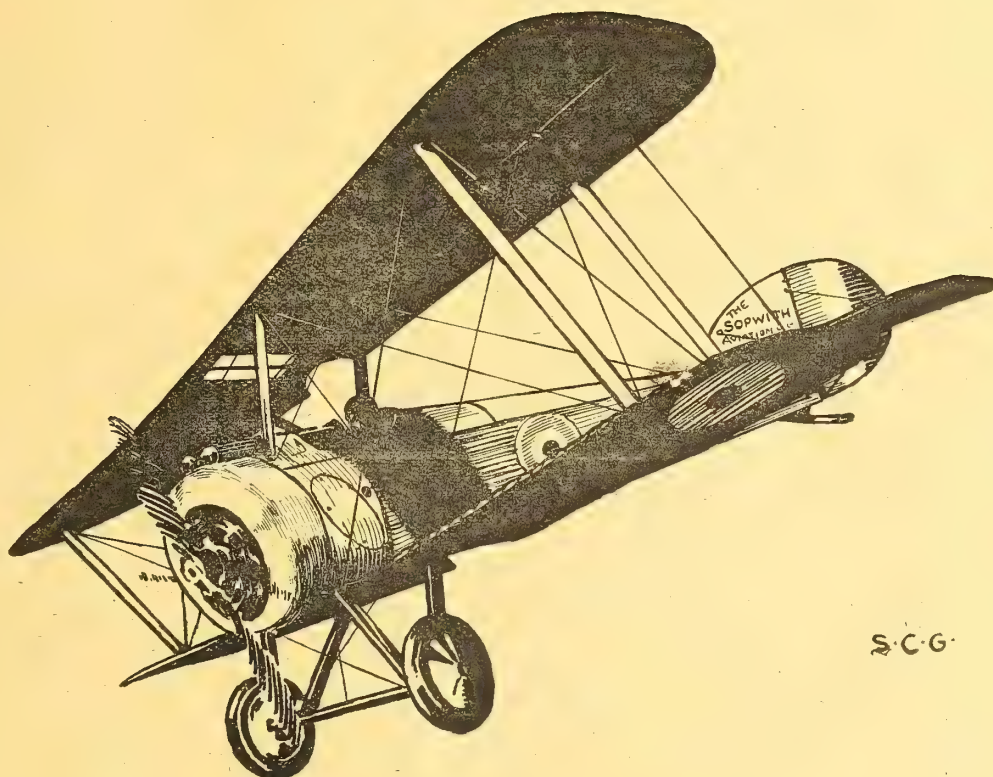
### THE INCIDENCE OF PROMOTION.

Nevertheless, so far from the 1914-5 men being "left out altogether," one imagines that it would be very hard to find any officer who joined the R.F.C. prior to June, 1915, who is now of lower rank than captain, and most of the survivors are majors, lieutenant-colonels, or generals. Of the men, very many of them have won to commissioned rank, several as high as major, and few are below the rank of serjeant. Any who have not thus been promoted must surely have something wrong with them somewhere, for the total personnel of the R.F.C. up to June, 1915, was not enough to fill the senior commissioned and non-commissioned ranks of the Corps as its numbers stand to-day.

Some, no doubt, have missed promotion through sheer bad luck, just as a few good officers and men have had the bad luck to be "booted" from the Corps by some thoroughly bad senior officer before the said senior himself has been found out and "booted" by the High Command. But, on the whole, such mistakes have been



# THE SOPWITH



S.C.G.

**AVIATION COMPANY, LIMITED**  
**KINGSTON-ON-THAMES, ENGLAND.**  

---

**CONTRACTORS TO H.M. GOVERNMENT.**

---

Telephone: KINGSTON 1988 (8 lines).  
Telegrams: SOPWITH, KINGSTON.



Paris Office :  
21, RUE DU MONT THABOR.



very rare, and in the great majority of cases where officers or men have been turned out of the Corps, or have been Stellenbosched, or have simply failed to obtain promotion, it has been their own fault or personal misfortune.

One recalls a conversation a year or so ago, with a lucky officer who had won promotion, concerning the old original personnel of the Corps. The name of a particularly brilliant and gallant pilot was mentioned, and surprise was expressed that he was not even a flight-commander. The reply explained everything: "Poor old X——! He's one of the best chaps in the world, but he couldn't command a corporal."

There you have a complete reason why some officers without a black mark of any kind against them are not promoted to the extent which their seniority seems to warrant, and it is an excellent argument against promotion by seniority. At the same time, one may perhaps remark that where an officer or a man has had a black mark put on his record by a senior who has afterwards been proved incompetent, or a "wrong'un" in other ways, he ought to have the right to claim to have that mark removed if he can prove that it was unjustly made. There certainly are cases where the Service careers of good men have been ruined by the action of men who were afterwards cleared out for incompetence or worse crimes. Still, even such ruin is all in the fortunes of war, and the chances of such trouble are much less than the chances of being hit by a bullet or a bomb.

#### A MATTER OF FIGURES.

Whence the Pilot's Young Wife obtained her figures, Heaven alone knows. The official figures are as accessible to the enemy as to any of the rest of us, but, official records or no official records, one refuses to believe that 1,500 flying officers and men of the R.F.C. were killed or died of wounds between 1914 and June of 1915. Allowing each squadron of those days its full complement of 12 pilots and, say, 8 observers, thus bringing the average of the flying personnel, including the single-seater flights, to 20 per squadron, that would mean 75 squadrons completely wiped out before June, 1915.

It hardly seems that one can be giving away military secrets by saying that the R.F.C. never had anything like 75 squadrons before June, 1915. During the first half of 1915 air fighting was hardly even an experiment, and "Archie's" shooting was merely futile. Personally one cannot recollect a case of a direct hit on one of our aeroplanes till quite late in 1915, and real organised air fighting hardly began before the days of Immelmann and Co. in the late autumn of 1915. Therefore it seems frankly impossible that the R.F.C. can have had 1,500 casualties or anything like that number. A careful count of the official casualty lists discloses that up to the end of June, 1915, less than 50 officers and men of the R.F.C. were killed or died of wounds, and these figures include all the aerodrome accidents abroad, as well as the fighting casualties.

The statement that only about 700 survive out of the original B.E.F. is equally ridiculous. It is not clear whether the good lady means officers or men or both, but she is wide of the mark either way. And she is probably equally wide of the mark whether her 700 is intended to represent survivors only, including crows, or able-bodied officers and, or, men still in the front line.

So far as the R.F.C. is concerned, if there are 200 survivors of the original R.F.C. aviators who were in France before June, 1915, the casualties of the Corps must have been lighter than one thought at the time, for, leaving out the people with jobs on the ground, there cannot have been many more than 200 people

actually flying before June, 1915, simply because there could not have been enough machines for them to fly.

#### MISPLACED GRATITUDE.

None can accuse those concerned with this paper of lacking admiration for the gallantry of the Service aviators, so one can safely say that the idea of giving D.S.Os. or D.C.Ms. to all the survivors of the first ten months of the war is simply absurd. The great majority of those who have earned these decorations, or their equivalent in special promotions, have had them long enough ago. To distribute them to all survivors would mean decorating a certain number of officers and men who have done no "distinguished service" and have not displayed "distinguished conduct," but have merely done their duty in that state of life to which it has pleased the High Command to call them. Some of them have only done their duty to such an extent as to avoid being turned out of the Corps. Some did hardly any flying. And it is well to remember that no matter what the R.F.C. people have had to stand while they were over the lines, they were only there for a few hours a day, and if they came home at all they returned to a decent bed and meal, whereas the men in the trenches and in forward gun positions have had to stay for weeks at a time in waterlogged trenches and emplacements under continual shell-fire, eating and sleeping as best they could.

One admits that D.S.Os. and D.C.Ms. have been awarded for less reasons in all branches of the Army, but such mistakes are no argument for increasing their number. In due course the survivors of 1914-15 will get their war medals, with the clasps to which they may be entitled, and, if the war goes on long enough, they will qualify for the Long Service Medal as well, so they seem to have little enough reason for grouching.

#### THE MAN-POWER QUESTION AGAIN.

A much more important question than the rewarding of survivors is the present question of Man-Power. Here is a letter from that same wife of a man in the R.F.C. who wrote recently complaining of the elderly married men in the R.F.C. being combed out for the infantry, while young able-bodied men are left in factories at home. In an intermediate letter she pointed out that her husband, a skilled workman, had been combed out after teaching his particular work to a lot of clever little "Jew-boys" who had wormed their way into the R.F.C. on the strength of being B1 or C1 men. Here are her further views:—

Dear Sir,—I was very interested in your article of this week; also the "Skilled Mechanic's" letter. Skilled, indeed, at 20! Why, in pre-war days he would only just be coming out of his apprenticeship!

I was talking to a man last week who has two sons in a big factory in Surrey. Their ages are 21 and 19, and they are earning over £3 a week. He said that some Jews had come there to work, and his son was told off to teach one and refused: he was not going to teach "a lot of aliens" and would down tools first.

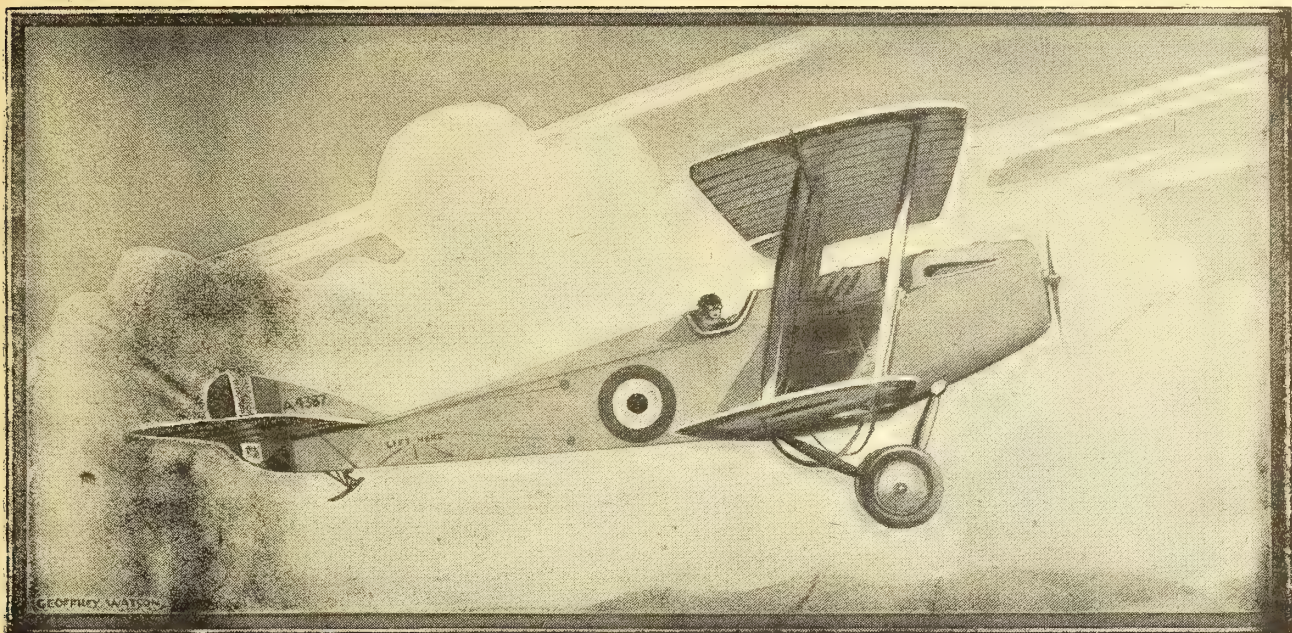
How many times was my husband called upon to teach these aliens, as they call them? He was a soldier and had to do as he was told or go for a D.C.M. [District Court-Martial, not Distinguished Conduct Medal.—Ed.] He could not down tools, and now he is to go to the trenches and fight for the country for to protect these men so as they can live in perfect peace and safety. It makes me absolutely disgusted.

My husband has a brother-in-law, a milkman's manager. He has obtained several exemptions, and was always an "A" man. Now he has had to join up, and all of a sudden he is a "B" man and has gone to Farnborough as an M.T. learner.

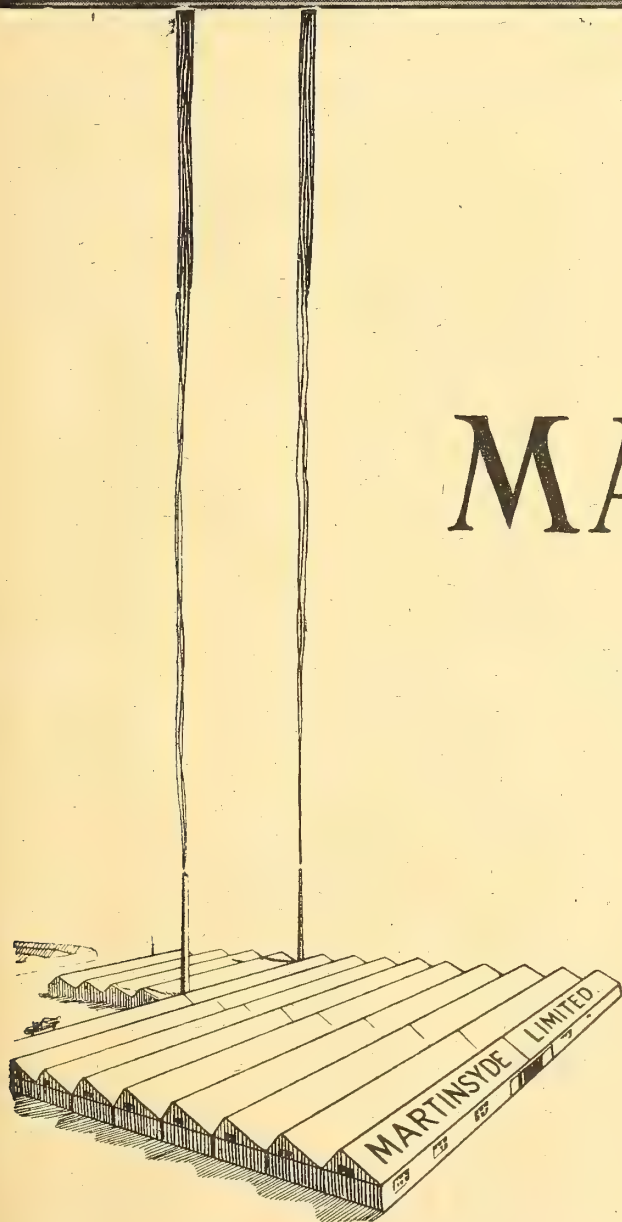
There is the injustice! Men who have spent their life at the motor trade are turned out and milkmen are taken in. Don't you think it's time something was done? The ones who are the cause of all this unjust treatment have no idea what a great amount of unrest it has caused among these men, and can it be wondered at?

Why, here is my husband won't even look at his brother-in-





# MARTINSYDE



Aerodrome and  
Auxiliary Works:  
BROOKLANDS.  
Head Office  
& Works:  
WOKING, Surrey.





law through it! For he is at the very same barracks at Aldershot as he spent his last few days. It cuts like a knife. In another six weeks he is supposed to be ready for the trenches.

All I hope is if these men are killed their faces will haunt all these new people to their dying day. But I suppose they would have the impudence to offer sympathy to the widows. Well, if I am one of those unfortunate ones, let them offer me sympathy. They will never go any further.

The paper tells us A.S.E. men of 30 are not to be taken for the Army. Why our men of 40?

There you have a perfectly clear view of one side of the man-power question by a sensible woman who is directly affected by it. When a woman is left to think for herself, and is not influenced by a mere man thing—as appears to have been the case in the letter quoted earlier in these notes—she seems to arrive at wonderfully correct conclusions without any particular line of reasoning. Which is why women will probably vote more sensibly than men when they have the chance at a General Election—which, one hopes, will be a general ejection of the present futile House of Commons.

Women, having always lived in subjection, have a strong instinct for justice apart from its reasons. Therefore, though doubtless our lawyer-politicians can give excellent reasons for keeping these hundreds of thousands of young unmarried men between 20 and 30 years of age out of the Army, or in "cushy" jobs as mechanics and clerks at home, while the old married men have to go and fight, the women only see that they are losing those dearest to them.

#### A WORD TO POLITICIANS.

The real reason, of course, for the action of the politicians is that by protecting the young men they hope to buy their votes. As a matter of fact, the British workman is not altogether a fool, and shortage of food always quickens the thinking faculties, so when, to quote Mr. Pemberton-Billing's remark made a year or two ago, "the empty head of the British workman is succeeded by an empty stomach," the Government will see trouble.

Already the workman despises our political "bosses" for the way in which they pander to his voting power. Now that women have the vote also it will be well for the politicians to consider the wisdom of amending their ways, and of trying honesty as the best policy—purely as a policy, of course, for one would not accuse any politician of being so weak as to be affected by the ethics or morals of his actions.

The present Government is much more likely to win votes in future by pushing into the Army all the young shirkers, for they will vote against it in any case, and will vote in favour of any blackguard Socialist or Syndicalist or Bolshevik who puts up in their constituency. Also everyone else will vote against the present Government, except the unthinking followers of the "Daily Mail," for all classes of the community, naval, military, Civil Service, clerical, financial (except those who are inside the Government ring), commercial, professional, and labour, hate and despise those who now hold power over the country. When Sir Edward Carson left the Cabinet the people's last remnant of trust in the ability and honesty of the Government went with him. One says this despite the fact that Sir Edward Carson's Irish policy is directly opposed to one's own.

Therefore the Government's only chance of capturing votes at a General Election, or, alternatively, to avoid being turned out by force, is to turn right round and adopt, in spite of its natural predilections, a policy of honesty, truth, fairness, and firmness.

The letter quoted indicates one important line along which such a policy would operate with advantage to all concerned. Here is another view from the inside:—

Sir,—I have read the article "On Propaganda and Things," and I am more than delighted with it, and ask you to kindly accept my heartiest congratulations.

I quite agree and support you in every statement, and the letter received from the youth is just a specimen of the average thinking working man.

Our workmen could be some of the finest, but take any shop or factory, and see what percentage of the employees attend evening classes or study their workmanship when their day's work is ended. Have we not every facility for them to do so, and at most nominal amounts?

I am a young married man (pre-war), not 30, engaged as an assistant-buyer on aeroplanes with a salary of £4 per week, against £120 per annum pre-war. Does my money cover the additional costs as the workman's does? I have to do many more hours, and have dirty surroundings to acclimatise myself to, but I do not strike.

I have tried many times to convince Society men that such Societies are only formed to protect the unskilled, incompetent, and unable-to-help-themselves sort of men. If our workmen would only think for themselves instead of paying 1s. to 2s. per week to Unions to keep top-hat men going about because they can tell a nice tale (and can do no good), they would be much better off financially and efficiently.

I have come to the firm conclusion that the average workman would spend the whole of his money (I cannot pledge myself to say *earnings*), whether it was £1 or £10, for he is incapable of looking after the future. Perhaps if a man was asked, "Would you have been better off had your parents made a provision for you when you came of age with a handsome sum, say £100?" it might strike him to make a provision for his children.

All that I can say as regards the Army is, I am classed as C 1, and do not look upon the Army as being an inviting occupation, but if they think I should be more useful to them there than at present, I should make no trouble of it, but do my utmost to make the very best of a bad job.

Now, one does not entirely agree with this correspondent, who represents apparently the extreme individualistic set which has grown up among the intelligent wage-earning class out of sheer exasperation with the tyranny of Democracy as applied by Trade Unions. One is all in favour of Unions, if intelligently led and handled.

The tyranny of Capital is not so bad as the tyranny of Democracy, simply because a slave, whether a chattel-slave or a wage-slave, must be fed decently if he is to do his or her work decently, whereas under Democracy—or mob-rule—there is nothing for anyone to eat—*vide* Russia and Finland to-day. Also class-hatred in a Democratic community is much more bitter than under a Capitalistic system, for the Capitalist is always ready for a sporting fight or gamble with a competitor for the top position, whereas Democracy means continual suspicion and spying and intriguing lest any one individual should climb out above the dead level slough of incompetence which represents the average of human intellect.

None the less, Trade Unions are necessary for the purpose of helping lame dogs over stiles and generally improving the lot of the wage-earner. It is only when they become political forces, and when the walking delegate, the shop-steward and the top-hatted labour leader begin to feel the lust for power that the evil of Trade Unionism comes in.

Nevertheless, the writer of the letter is absolutely right in reproaching the ordinary workman with not educating himself in his particular work. The more a man knows about his work the easier the work is to do, the more money he can earn at it, and the better are his chances of promotion. This is precisely where the American workman scores so heavily. And it is precisely at this that the new systems of apprenticeship are aiming.

How many of the men who are to-day drawing their £8 to £10 a week on piece-work are laying it by to educate their children, and how many are spending it as fast as they can? Quite a great deal of the discontent to-day is due to the fact that there is not enough food and beer available to enable the workman to get rid of his big money by buying it, and he has no idea of



*Britain Supreme in the Air!*

# ROLLS-ROYCE AERO ENGINES

like Rolls-Royce Cars, are the Best in the World. By their wonderful achievements they have made Britain — and her Allies — supreme in the Air.

**CLIMBS MOST RAPIDLY** — An Aeroplane fitted with ROLLS-ROYCE engine holds the WORLD'S RECORD FOR RAPID CLIMBING.

**FLIES MOST SWIFTLY** — An Aeroplane fitted with ROLLS-ROYCE engine holds the WORLD'S RECORD FOR SPEED in the air.

**MOST RELIABLE, FLIES FARTHEST** — An Aeroplane (Handley Page) fitted with ROLLS-ROYCE engines holds the WORLD'S RECORD FOR LONG DISTANCE FLIGHT under war conditions—viz.: London to Constantinople.

**CARRIES MOST WEIGHT** — An Aeroplane (Handley Page) fitted with ROLLS-ROYCE engines holds the WORLD'S RECORD FOR WEIGHT CARRYING—viz.: London to Constantinople—total weight SIX TONS.

**CARRIES MOST PASSENGERS** — An Aeroplane (Handley Page) fitted with ROLLS-ROYCE engines holds the WORLD'S RECORD for carrying TWENTY-ONE PERSONS to a height of over 7,000 FEET.

# ROLLS-ROYCE

Contractors to H.M. Government.

LTD.

14 AND 15, CONDUIT STREET, LONDON, W. 1.

Telegrams: 'Rollhead Reg, London.'

Telephones: 1654 Gerrard (3 lines)

AND AT PARIS, NEW YORK, PETROGRAD, MADRID AND BOMBAY.



spending money on anything else—except perhaps in betting. The Government might help him out by organising gambles in Premium Bonds, but the Nonconformist Conscience jibs at such a plain, common-sense way of keeping the working man quiet and amused.

#### THE FORCE OF EXAMPLE.

Here and there a shrewd man saves his money and buys house property, and promptly ceases to be a good Trade Unionist. The Syndicalist always reminds one of the workman who had been preaching Socialism to a pal. After the exposition the pal said: "D'you mean to tell me that if you had two estates you'd give me one of 'em?" "Of course I would," replied the Socialist. "And if you had two houses, you'd give me one?" asked the pal. "Yes, of course," was the reply. "And if you had two cows you'd give me one?" came the next question. "Certainly," said the Socialist. "And if you had two pigs you'd give me one?" asked the pal. "Ah!" replied the Socialist, cautiously. "You know, I've got two pigs."

It is entirely a question of what is the precise line at which Socialism ends and Individualism begins. With most people the line is drawn very clearly and distinctly

just above the amount of property which they happen to possess themselves. So when a chap begins talking Socialism just ask him to prove his belief for a start by dividing up whatever money he has in his possession among the assembled company.

#### OUR PRESENT NEED.

What is wanted is not Individualism, which leads to Anarchy as quickly as does Socialism, but a proper spirit of Patriotism, through which each individual is brought to do his best for his Fatherland. Patriotism, with its minor manifestations such as *esprit de corps*, playing for the side, helping a pal, is the only sentiment and the only "ism" which can hold a people or a nation or an empire together.

If the British people have sufficient patriotism to pull them through the bad time which is coming during the next twelve months, we shall win this war. If not, German patriotism, skilfully guided by the natural leaders of the German nation—as surely as our unnatural leaders have almost succeeded in killing patriotism in this country—will beat us. And we shall deserve to be beaten.—C. G. G.

#### LORD ROTHERMERE'S LOSS.

Capt. the Hon. Harold Alfred Vyvyan St. George Harmsworth, M.C., Irish Guards, eldest son of Lord Rothermere, President of the Air Council, died on Feb. 12th, from wounds received on Nov. 30th last in the battle of Cambrai. He was born in 1894, educated at Eton and at Christ College, Oxford. In 1915 he received a commission in the Irish Guards Special Reserve, and in the following year was gazetted captain at the age of 22. He had been three times wounded in action.

Lord Rothermere has lost two sons in the war, and a third son is on active service. His second son, Lt. the Hon. V. S. T. Harmsworth, Royal Naval Division, was killed in action in the battle of the Ancre on Nov. 13th, 1916, at the age of 21. His remaining son, the Hon. Esmond Cecil Harmsworth, is a lieutenant in the Royal Marine Artillery.

All concerned with aeronautics will offer the President of the Air Council their sympathy in his loss, and will honour him the more for the sacrifices which his children have made for their country's sake.

#### AIRCRAFT IN THE HOUSE.

On Feb. 13th Mr. Bonar Law, in the course of the Debate on the King's Speech, and while reviewing the production of munitions for 1917 said that the supply of aeroplanes in 1917 was two and a half times that of 1916.

On Feb. 18th the following notices of motion were given:—

**Mr. Denman:** On the Air Service Estimates, to call attention to the manufacture of aeroplanes and move a resolution.

**Mr. Harcourt:** To call attention to the scheme for an aviation ground in Ayrshire.

**Major Davies:** To call attention to the Medical Service of the Air Board.

**Mr. Kellaway,** replying to inquiries on the Vote for the Ministry of Munitions, said that the last half-year's output, with the 12½ per cent. bonus operating part of the time, showed the following increases of production, as compared with the previous six months:—

Aeroplanes .....	42 p.c.
Aeroplane engines .....	68 p.c.

#### FROM AN OLD FRIEND.

A postcard from Flt.-Lt. Jack Alcock, R.N., Prisoner of War at Kados, Turkey, says: "I can assure you this is quite a different life to flying the old Sunbeam-Farman. I have just done my first two months of it. Was let down with engine trouble while on a night raid to the old city. Tell Coatalen I shall be ready for any big stunt after the war. Best wishes to all."

The postcard is dated 28/11/17, and was delivered 11/2/18, so the post from Turkey appears to be a trifle slow. None the less the tone of the message gives one every reason to hope that all is still well with our old friend, for the Turks have the reputation of treating officer prisoners like gentlemen. Doubtless Lt. Alcock will be glad to hear from friends in this country, and letters to him should be addressed as above

#### THE "ALL SAFE" ENGINEER.

When the war broke out and we went in,  
The British army was uncommon thin.  
Lord Kitchener said, "War will last three years."  
And the Government called on us for volunteers.  
The first to go was my brother Jim  
And very, very proud were we of him.  
But all these things don't interest me—  
For now I am a member of the A.S.E.

When Jim came back he had lost an arm  
Which rather filled me with alarm.  
But he soon got well, 'twould make you laugh.  
For now he is a captain on the H.Q. staff.  
I soon found a job in an aircraft yard.  
The pay is good, and I don't work hard.  
But whoever goes next it won't be me  
For I am a member of the A.S.E.

We were no nearer to smashing the Hun  
So they raised the age to forty-one.  
Then Derby went out on the cadge  
And invited young unmarried men to wear a badge.  
Most married men joined in their class  
And all my chums went off in a mass.  
But with all their schemes they didn't get me  
For I am a member of the A.S.E.

The Conscription Bill came into force  
All had to go as a matter of course  
They took my uncle, they took my dad,  
And my little brother, who is only a lad.  
I had to pass the medical board,  
But though I was fit they couldn't afford  
To send out a useful man like me  
For I am a member of the A.S.E.

The war is now in its fourth year  
Which means more men I greatly fear.  
They told my foreman he must go and fight,  
But I got his job so that's all right.  
They've diluted the trades as far as they can,  
And many a woman takes the place of a man.  
But none of these things interest me,  
For I am a member of the A.S.E.

Sir Auckland Geddes to Glasgow went  
To explain to us what Man Power meant—  
Democracy must win this war.  
We told him that is just what we are working for.  
So let the Man Power Bill go through.  
But this I have to say to you:  
Before the Army can comb out me  
They must call up every member of the A.S.E.  
T. W. H. M. T.

#### THOSE WORLD'S RECORDS

The following letter has been received:—

Sir,—I would inquire of the Rev. Harry Knox, as the Hebrew did of Moses in the days of old, "Who made thee a judge over us?"  
Yours truly, (Signed) ENQUIRER."



# S. E. SAUNDERS

LIMITED  
ESTD 1830

DESIGNERS & CONSTRUCTORS  
OF AIR AND MARINE  
CRAFT



Head Office and Productive Works  
**EAST COWES. I.W.**

Erecting & Testing

Solent Yard, Cowes & West Medina Aerodrome  
Osborne Works, E. Cowes East Cowes  
SEAPLANES LAND MACHINES

Telegrams 'CONSUETA EAST COWES'  
Phone COWES 193 (4 Lines)



## Deductions from the World War: A Review.—(Continued.)

BY HENRY FORESTER.

### A LESSON TO THE "DAILY MAIL."

In his long chapter on Leadership, which I commend to the "Daily Mail" and a Mr. Lovat Fraser who writes querulously for that print, he emphasises the necessity of the study of military history on the part of ambitious soldiers. Experience in one war or one mode of warfare or study of one campaign leads to one-sidedness and to a restriction of thought which can only result in failure. In many respects the South African campaign of 1899-1902 was a curse to the Army.

The long years of peace had been devoted to a system of training directed towards efficiency in the type of warfare likely to be experienced in the classic fields of Europe. There had been no opportunity to put such training to the test. Then at length in place of a war in Europe the guerilla hostilities against the Boer Republics came to displace all the preconceived ideas of the past generation.

It was a kind of war that could be waged nowhere else, save perhaps in the cinema-type republics common to the terrain of South America, where the names of the Government are recorded by tape machines because the newspapers are printed only once in each day. Nearly all that was learned in South Africa, and was impressed on the troops by ill-advised agitation at home, had to be unlearned at great expense in the days that followed. By the time the present war began almost all the lessons of South Africa had faded and the Army was itself again. Such is the result of the study of one individual war.

### A REVIVAL IN TACTICS.

The outflanking tactics common in the days of Frederick the Great have given place in a large degree to the principle of "breaking through" much in the manner in which, on a smaller scale, Marlborough defeated the French at Blenheim. This has arisen mainly from the increase of battle front consequent on the improvement of firearms. The hostilities of the present day and of the future will be waged with huge masses of men and require an adjustment in the qualities of leadership.

The commander is less able to undertake the control of detailed operations, and is more than ever dependent on a highly trained and loyal staff, on which he must, moreover, be able to impress his personality.

### THE IMPORTANCE OF NUMBERS AND NOVELTY.

Von Freytag-Loringhoven is of Napoleon's view of the importance of numbers in war. He concurs even in Stegemann's view that at the Battle of the Marne the "completion of the battle was abandoned" because the German offensive was "no longer strong enough to break through in the face of an enemy country bristling with armaments" (p. 75). He offers no new key to leadership because there is none to be found other than inborn genius aided by careful study and lengthy experiences.

### THE INVASION OF GERMANY.

According to a Berlin official telegram of Feb. 11th, 31 enemy air attacks on the German Homeland were carried out during January, 15 of which were directed against Lorraine and Luxemburg industrial districts and 14 on the open towns.

On Ludwigshafen and Freiburg there were three attacks in each case, on Trèves two attacks, and on Friedrichshafen, Rastatt, Offenbourg, Mannheim, Karlsruhe, and Heidelberg, one attack each. The telegram continues:—

Although the number of attacks compared with the previous month was considerably increased, owing to the favourable weather, the damage and casualties were fortunately smaller,

With Napoleon he also agrees in some degree that it is necessary to change one's tactics once in ten years. But in peace an army is apt to be inert. Politics, finance, the very absence of movement, all tend to make soldiers drift in a groove from which it is hard to move.

It therefore follows that in peace the art of good leadership is greater than in the opportune period of war. In war all are working for one end, and the chance of distinction is an ever-ready incitement to do that which is proper. In peace, on the other hand, the zealous are alone against the world in their efforts to maintain efficiency, and, more than efficiency, the spirit of progress.

### THE ARMY OF THE FUTURE.

As to the army of the future he has much that is interesting to say. The infantry will, he thinks, require an increase in the number of machine-guns allotted to a battalion—this, too, from a member of a nation which in pre-war days allowed nearly four times as many of these weapons to each battalion as any other nation.

Field artillery, he thinks, requires no increase, but an infinitely greater number of howitzer batteries will be necessary. One has gathered that such would be the German view from the popularity of that weapon with the enemy on the Western front.

A considerable increase is also necessary in the case of garrison artillery, engineers, bomb-throwing companies, railway, telegraph, and motor troops, and the flying corps.

He says, contrary to the opinions of the man in the armchair, that cavalry must be maintained at its present strength, and that trench warfare must not lead us to wrong conclusions.

He says, "At the beginning of the war, in the West, and later on in the East (especially in Lithuania), our cavalry have performed very valuable services, and the same may be said in regard to the campaign against Roumania. As soon as the war was carried into the open country, the cavalry at once asserted its importance" (p. 110). And so it will again when the war in its final phase opens out once more.

### DRILLS AND TRAINING.

He emphasises the necessity of retaining the traditional system of drill, not only in order to attain instinctive cohesion and steadiness, but because it "inspires the soldier with a sense of the urgent necessity to obey his officer" (p. 115).

Training in peace-time must be directed more towards tactics and less towards strategy. Strategy will always remain a paper game in times of peace.

### THE NATIONAL SPIRIT.

The necessity of preparation for the future is repeated again and again. The people must be inspired with military ideals sufficient to make them realise the primary duty of defending their own country by a vigorous and whole-hearted offensive at the proper time.

(To be continued.)

Five persons were killed and nine wounded, while the material damage done was insignificant. There was no resultant interruption of work worth mentioning. The enemy lost four aeroplanes in the course of these attacks.

### A GREAT CONSOLATION.

During Saturday night's raid a juvenile humourist, aged 13, sitting in his pyjamas, toasting his toes by the fire in a friend's flat two floors below his own, whither he had been transferred from bed by a protective mother, remarked philosophically, "Well! I'm glad I don't live in Jupiter, where they have four moons!"



THE BRITISH & COLONIAL  
AEROPLANE CO., LIMITED

— FILTON, BRISTOL —

CONSTRUCTORS OF

*The "Bristol" Aeroplanes.*

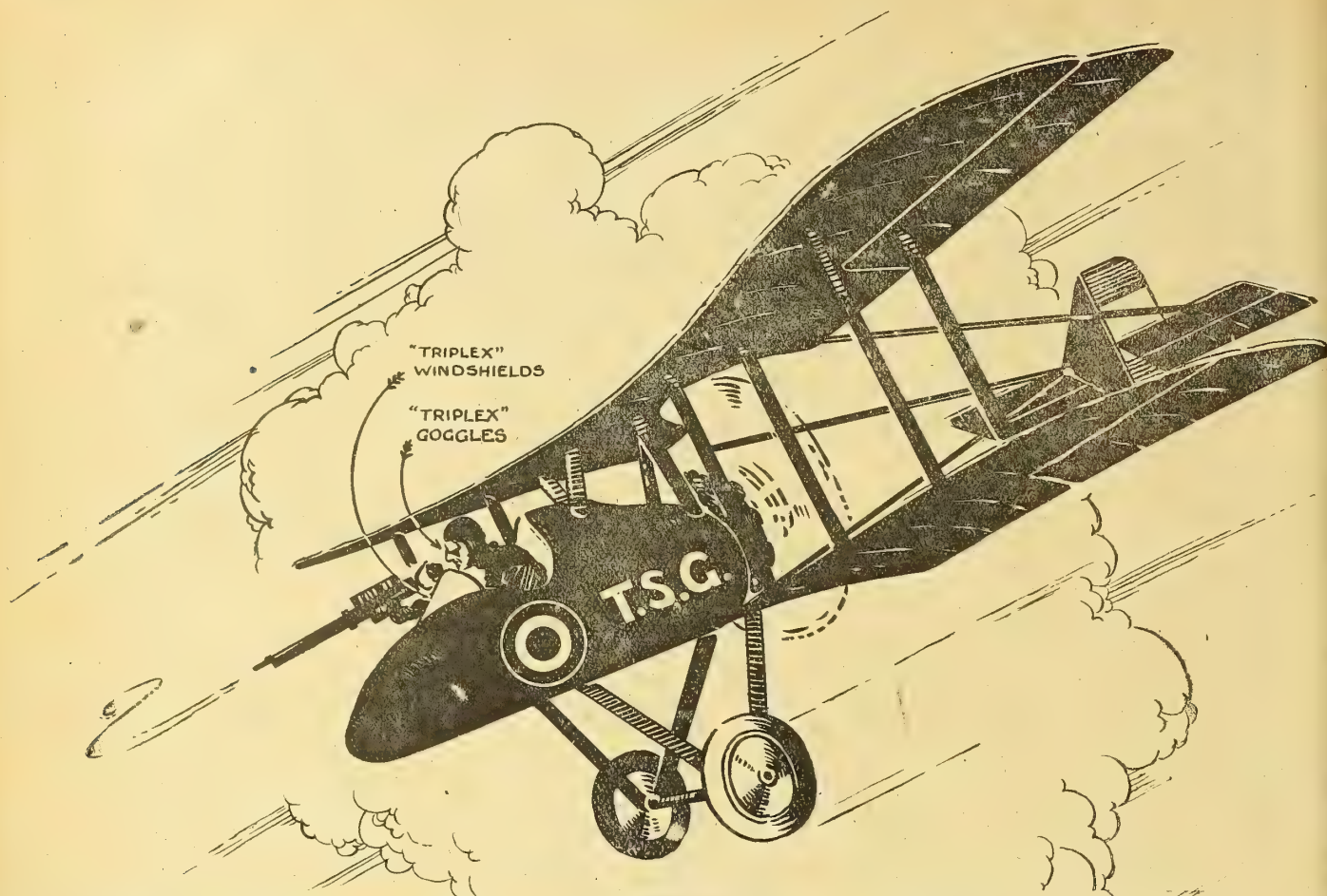
— CONTRACTORS TO —  
H.M. AIR FORCES.

Telegrams :  
"AVIATION, BRISTOL"



Telephones :  
3906 BRISTOL  
(Private Branch Exchange)





# Triplex Safety Glass

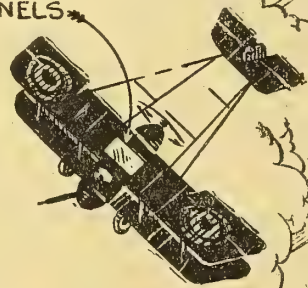
has proved itself to be without an equal for Goggles, Windshields, Windows, and Observation Panels. Clear as ordinary glass yet absolutely unsplinterable under all conditions. Has the approval of H.M. Admiralty and War Office.

Investigate "Triplex." Illustrated Catalogue on request.  
**THE "TRIPLEX" SAFETY GLASS CO., LTD.**  
 1, Albemarle Street, Piccadilly, London, W.  
 REGINALD DELPECH (Managing Director).

Telephone Regent 1340.

Telegrams: "Shatterlys, Piccy, London."

"TRIPLEX"  
OBSERVATION  
PANELS

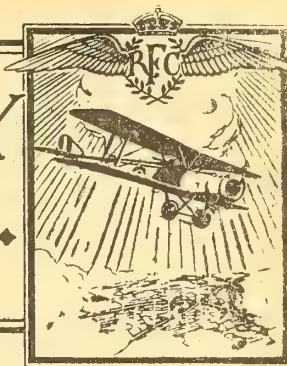


W





# NAVAL and MILITARY AERONAUTICS



## FROM THE "LONDON GAZETTE."

ADMIRALTY, Feb. 9th.

R.N.A.S.—Flt. Lt. to be Flt. Comdr.:—W. R. Mackenzie, D.S.C., Dec. 31st, 1917.

To be Temp. Sqdn. Obsvr.:—T. Haggerston, Feb. 6th.

WAR OFFICE, Feb. 12th.

REGULAR FORCES.—ESTABLISHMENTS—R.F.C.—MIL. WING.—Brig. Instr. in Gunnery.—(Graded as a Park Comdr.—Capt. H. E. F. Wyncoll, M.C., Notts and Derby R., from an Instr. in Gunnery (graded as an Equipt. Officer, 1st Cl.), and to be temp. Maj. whilst so empld., Jan. 19th.

Adjut.—The appt. of Lt. (temp. Capt.) T. M. Eggar, Lond. R., T.F., notified in the "Gazette" of Sept. 19th, 1917, is cancelled.

The following Officers have been brought to the notice of the Secretary of State for War, by the Army Council, for very valuable services rendered in connection with the war up to Dec. 31st, 1917:—

PITCHER, Maj. and Bt. Lt.-Col. (temp. Brig.-Gen.) D. Le G., Ind. Army.

WEIR, Maj. (temp. Lt.-Col.) J. G., R.F.A.

WHITTINGTON, Capt. (temp. Col.) C. H., R.F.C., Spec. Res.

OVERSEA MILITARY FORCES OF CANADA.—MAUND, Lt. (temp. Lt.-Col.) A. C., Manitoba R. and R.F.C.

WAR OFFICE, Feb. 14th.

REGULAR FORCES.—STAFF.—The following temp. appts are made at the War Office:—Asst. Controller of Salvage.—Temp. Capt. W. S. Smith, Gen. List, from Equipt. Officer, 1st Cl., R.F.C., and to be temp. Lt.-Col. while so empld., Jan. 25th.

ESTABLISHMENTS.—R.F.C.—MIL. WING.—Flt. Comdrs.—Temp. Lt. (temp. Capt.) S. B. Smith, Gen. List, from Equipt. Officer, 2nd Cl., and to retain his temp. higher rank, while so empld., Feb. 22nd, 1917; Maj. R. H. Howell, Ind. Cav., from a G.S.O., 3rd Gr., at the War Office, Jan. 24th, seny. Feb. 1st, 1917; Temp. Sec. Lt. K. B. Montgomery, Gen. List, from a Flying Officer, and to be temp. Capt. whilst so empld., Jan. 2nd; temp. Capt. E. V. Longinotto, Gen. List, from a Flying Officer, Jan. 28th.

Asst. Instrs. in Gunnery (graded as Equipt. Officers, 2nd Cl.)—And to be temp. Lts. whilst so empld., Feb. 16th, 1918; Temp. Sec. Lt. L. M. Nava, Gen. List, from Flying Officer (Obsr.); Temp. Sec. Lt. W. H. M. Groom, Gen. List, from an Asst. Instr. (graded as an Equipt. Officer, 3rd Cl.).

Adjts.—Capt. T. B. Marson, Yeo, T.F., Dec. 18th, 1917; Capt. C. J. Page, Lond. R., T.F., and to be secd., Feb. 1st.

Park Comdr.—Qrmr. and Hon. Lt. (temp. Capt.) W. J. Waddington, R.F.C., from Equipt. Officer, 1st Cl., and to be temp. Maj. whilst so empld., Jan. 22nd.

SCHOOLS OF INSTRN.—SCHOOLS OF MIL. AERONAUTICS.—Instr. (graded as an Equipt. Officer, 1st Cl.)—Temp. Capt. O. S. Mosley-Leigh, Gen. List, a Flt. Comdr., Dec. 5th, 1917.

GEN. LIST.—Temp. Sec. Lt. R. G. Fyfe, Gen. List, an Equipt. Officer, 2nd Cl., to be temp. Capt. whilst specially empld., Jan. 14th; Lt. R. Saville, from R.N.A.S., to be temp. Capt., Jan. 26th.

WAR OFFICE, Feb. 15th.

REGULAR FORCES.—ESTABLISHMENTS—R.F.C.—MIL. WING.—Flt. Comdrs.—From Flying Officers,—Capt. W. R. B. Gifford, Midd'x R., Spec. Res. (Jan. 8th); Capt. E. C. Stonehouse, A.S.C., T.F. (Jan. 26th). And to be temp. Capt. while so empld.:—Temp. Lt. P. G. K. Bridgwood, York and Lanc. R., and to be transf'd. to R.F.C. Gen. List; Temp. Sec. Lt. C. J. S. Lea, Gen. List (Dec. 5th, 1917); Lt. P. B. Pattison, Spec. Res. (Jan. 21st); Temp. Sec. Lt. F. Hobson, Gen. List (Jan. 26th); Temp. Sec. Lt. I. W. Parnell, Gen. List (Jan. 30th); Temp. Sec. D. L. Nutt, Gen. List (Jan. 31st); Temp. Lt. T. K. Twist, Gen. List; Lt. H. S. Marten-Smith, Lon. R., T.F. (Feb. 4th). Temp. Capt. (temp. Maj.) B. H. Turner, Gen. List, reverts from a Sqdn. Comdr., and relinquishes the temp. rank of Maj. (Jan. 27th, sen. July 31st, 1915).

SCHOOLS OF INSTRN.—Comdt.—(Graded as Sqdn. Comdr.)—Capt. L. F. Richard, R.A., a Flt. Comdr., and to be temp. Maj. while so empld. (Aug. 16th, 1917).

MEMORANDUM.—Bt. Lt.-Col. D. S. MacInnes, C.M.G., D.S.O., R.E., to be temp. Brig.-Gen. while empld. as Insp. of Mines, vice Bt. Col. (temp. Brig.-Gen.) R. N. Harvey, C. B., C.M.G., D.S.O., R.E. (Jan. 4th).

WAR OFFICE, Feb. 16th.

REGULAR FORCES.—STAFF.—SPECIAL APPOINTMENTS.—(Graded for purposes of pay as a Staff Capt., whilst empld. as a Sqdn. Comdr., R.F.C. Cadet Wing.)—Temp. Capt. H. A. Drewe-Mercer, Gen. List, Oct. 9th, 1917.

R.F.C.—MIL. WING.—Flt. Comdr.—Lt. L. G. Paling, Notts and Derby R., Spec. Res., from a Flying Officer, and to be temp. Capt. whilst so empld., Feb. 2nd.

SCHOOLS OF INSTRN.—SCHOOLS OF AERIAL GUNNERY.—Instr.—Graded as a Flt. Comdr.—Lt. (temp. Capt.) D. H. S. Davies, R. War. R., from an Instr. in Gunnery (graded as an Equipt. Officer, 1st Cl.), and to retain his temp. rank whilst so empld. Jan. 3rd.

MEMORANDA.—The undermentioned to be temp. Maj.: Capt. D. C. Willock, R.H. and R.F.C., T.F., whilst empld. under Ministry of Munitions, Nov. 14th, 1917.

Serjt. Charles Proberts, from R.F.C., to be Sec. Lt. whilst serving with R.F.C., Jan. 21th, 1918.

WAR OFFICE, Feb. 18th.

REGULAR FORCES.—ESTABLISHMENTS—R.F.C.—MIL. WING.—Sqdn. Comdr.—Lt. (temp. Maj.) C. H. Nicholas, S. Wales Bord., Spec. Res., from a special appt. (graded as a Sqdn. Comdr.), and to retain his temp. rank whilst so empld., Sept. 19th, 1917.

Flt. Comdr.—Lt. (temp. Maj.) K. T. Dowding, R.W. Surr. R., T.F., to revert from a Sqdn. Comdr., to relinquish his temp. rank, and to be temp. Capt. whilst so empld., Jan. 19th, seny. May 22nd, 1916.

Adjut.—Temp. Lt. G. W. Beor, Res. Regt. of Cav., to be transf'd. to R.F.C. Gen. List, and to be temp. Capt. (with pay and allowances as Lt.) whilst so empld., vice Lt. L. A. K. Butt, S. Staff. R., Jan. 25th.

Park Comdr.—Lt. (temp. Capt.) J. L. Luntley, Spec. Res., from an Equipt. Officer, 1st Cl., and to be temp. Maj. whilst so empld., Jan. 26th.

Gen. List.—The name of Temp. Sec. Lt. (now temp. Capt.) Cyril Stone Danby is as now described, and not as in the "Gazette" of Oct. 16th, 1914, and subsequent "Gazettes."

MEMORANDUM.—Capt. S. J. Hutchinson, Lond. R., T.F., an Equipt. Officer, 3rd Cl., is secd. for duty with R.F.C., May 9th, 1917.

\* \* \*

The King has been pleased to confer the following rewards for gallantry and distinguished service in the Field. The acts of gallantry for which the decorations have been awarded will be announced in the "London Gazette" as early as practicable:—

A BAR TO THE DISTINGUISHED SERVICE ORDER.

Sec. Lt. (Temp. Capt.) I. T. B. MCCUDDEN, D.S.O., M.C., Gen. List, and R.F.C. (D.S.O. gazetted Feb. 4th).

THE DISTINGUISHED SERVICE ORDER.

Temp. Capt. W. G. BARKER, M.C., Gen. List and R.F.C.

CANADIAN FORCE.

Maj. A. D. CARTER, Inf. and R.F.C.

BAR TO MILITARY CROSS.

Temp. Capt. (A. Maj.) H. O. HOLMES, M.C., R.F.C. (M.C. gazetted Jan. 1st).

Sec. Lt. (Temp. Capt.) C. A. STEVENS, M.C., W. Rid. R. and R.F.C. (M.C. gazetted Oct. 27th, 1917).

THE MILITARY CROSS.

Lt. F. A. BATES, Yeo, and R.F.C.

Temp. Lt. (T. Capt.) J. C. B. FIRTH, Gen. List and R.F.C.

Sec. Lt. A. C. B. HARRISON, Oxf. and Bucks L.I., and R.F.C.

Temp. Sec. Lt. (Temp. Capt.) N. MACMILLAN, Gen. List and R.F.C.

Lt. (Temp. Capt.) J. MITCHELL, R.F.C., Spec. Res.

Temp. Sec. Lt. K. B. MONTGOMERY, Gen. List and R.F.C.

Capt. L. G. S. PAYNE, Suff. R. and R.F.C.

Temp. Sec. Lt. F. G. QUIGLEY, Gen. List and R.F.C.



Sec. Lt. (Temp. Capt.) H. A. SMITH, Midd'x R. and R.F.C.  
 Lt. (Temp. Capt.) G. T. WILLCOX, High. L.I. and R.F.C.  
 AUSTRALIAN IMPERIAL FORCE.  
 Lt. L. W. SUTHERLAND, F.C.

## AMENDMENTS.

The following are the correct descriptions of Officers upon whom rewards have recently been conferred:—

Temp. Sec. Lt. A. R. H. NOSS, M.C., Gen. List and F.C.  
 (M.C. gazetted Jan. 8th, 1918).  
 Capt. and Flt. Comdr. S. I. WINTER-IRVING, M.C., Aust. F.C.  
 (M.C. gazetted Jan. 18th, 1918).

## FROM THE COURT CIRCULAR.

BUCKINGHAM PALACE, Feb. 13th.

The following Officer was introduced into the presence of His Majesty, when the King invested him with the Insignia of an Officer of the Most Excellent Order of the British Empire:—  
 Wing Comdr. FRANK BROCK, R.N.A.S.

BUCKINGHAM PALACE, Feb. 14th.

Lt. T. B. Bruce, R.F.C., had the honour of being received by the King this morning.

BUCKINGHAM PALACE, Feb. 15th.

The Prince Albert, attended by Staff Surgeon Louis Greig, R.N., has arrived at the Palace from the Royal Naval Air Station, Cranwell.

BUCKINGHAM PALACE, Feb. 16th.

The King then conferred decorations as follows:—

## THE DISTINGUISHED SERVICE CROSS.

Flt.-Comdr. NOEL KEEBLE, R.N.A.S.  
 Flt.-Lt. REGINALD SOAR, R.N.A.S.  
 Flt.-Lt. DESMOND FITZGIBBON, R.N.A.S.

## THE ALBERT MEDAL IN GOLD.

NICHOLAS RATH, Seaman, R.N.A.S.

## THE ALBERT MEDAL.

RICHARD KNOULTON, Ordinary Seaman, R.N., and GEORGE ABBOTT, Deckhand, R.N.R.

BUCKINGHAM PALACE, Feb. 18th.

The Prince Albert, attended by Staff Surgeon Louis Greig, R.N., left the Palace for the Royal Naval Air Station, Cranwell.

## NAVAL.

The following appointments have been made in the Royal Naval Air Service:—

FEB. 14th.—Lts., R.N.V.R. (Temp.).—J. P. Bourke and P. Hutchinson both promoted to Lt.-Comdrs., R.N.V.R. (temp.), seny. Dec. 31st, 1917.

## ADMIRALTY COMMUNIQUE.

FEB. 17th.—On Feb. 16th a bombing raid was carried out by naval aircraft on Zuydweghe Dump (south of Bruges).

Many bombs were dropped, and a fire was observed to start in the middle of the objective.

All our machines returned safely.

FEB. 18th.—Naval aircraft carried out a bomb raid on Uytkerke aerodrome at about noon on the 17th. Many bombs were dropped on the objective.

One enemy aircraft was shot down out of control.

All our machines returned safely.

## THE CASUALTY LIST.

Reported Feb. 13th.

MISSING.—Day, Flt. Sub-Lt. H., R.N.

ACCIDENTALLY INJURED.—Radcliffe, Flt. Sub-Lt. J. A., R.N.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER.—Carr, Flt. Sub-Lt. J. H. T., R.N.

Reported Feb. 18th.

ACCIDENTALLY KILLED.—Jewell, Flt. Sub-Lt. C., R.N.

PREVIOUSLY REPORTED WOUNDED, NOW REPORTED DIED OF WOUNDS.—Binks, Flt. Sub-Lt. A. J., R.N.

PREVIOUSLY REPORTED MISSING, NOW OFFICIALLY PRESUMED DROWNED.—Hood, Flt. Sub-Lt. T. S. S., R.N.

ACCIDENTALLY INJURED.—Bradley, Prob. Flt. Officer H. J., R.N.

Illingworth, Prob. Flt. Officer W. G., R.N.

Wilby, Prob. Flt. Officer R. B., R.N.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER.—Bronson, Flt. Lt. C. G., R.N.

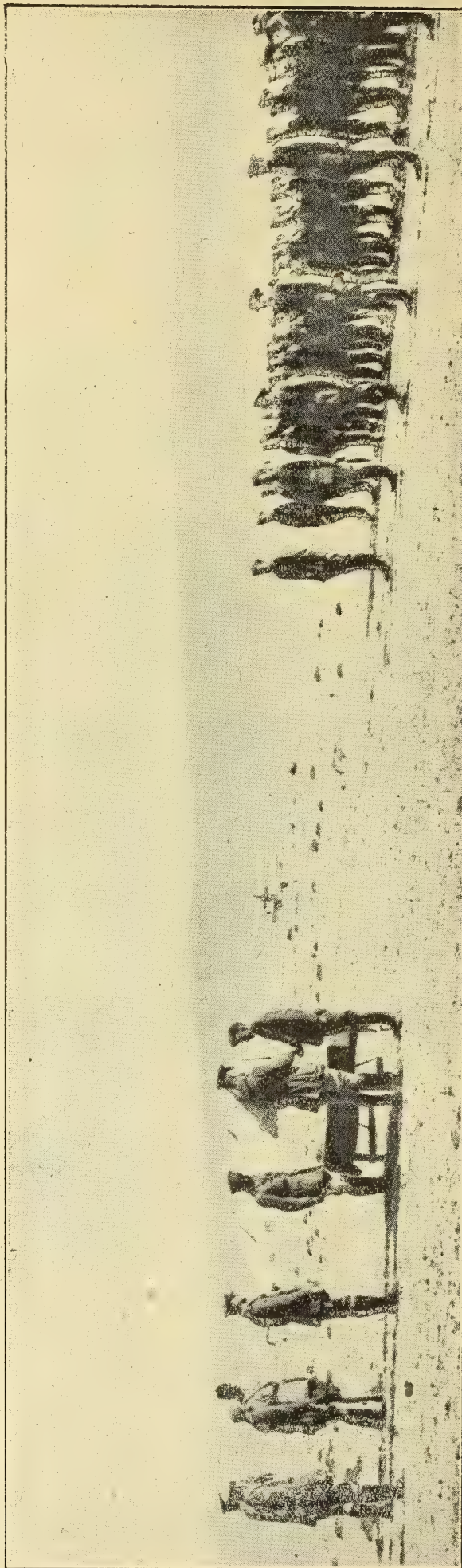
## PERSONAL NOTICES.

## MARRIAGES.

MCCLEAN-WALE.—The marriage of Wing-Comdr. F. K. McClean, R.N.A.S., son of the late Frank McClean, F.R.S., LL.D., of Rushall House, Tunbridge Wells, and Aileen, elder daughter of Mr. and Mrs. W. H. Wale, of Lapworth, Warwickshire, took place on Feb. 16th, at St. Paul's, Knightsbridge. The officiating clergy were the Rev. Francis Leith Boyd, Prebendary of St. Paul's, and the Rev. E. H. Couchman, Rector of Honiley and Wroxhall.

The bride was given away by her father. Miss Joyce Wale, sister of the bride, was the only bridesmaid.

(Continued on page 763)



IN THE HOLY LAND.—General Allenby presenting honours to officers and men of the R.F.C. in Palestine. The scenery gives one to wonder why the country was selected by the Chosen People, and still more why they want it back.





# AIRCRAFT MANUFACTURING COMPANY———LIMITED

Contractors to  
War Office and Admiralty

London Office

27, BUCKINGHAM GATE, S.W.1.

Offices & Works

HENDON, N.W.9.



A large biplane is shown in flight, angled upwards and to the right. It has a single engine on the upper wing and a large propeller. Below it, a smaller biplane is also in flight, angled downwards and to the right. The background shows a hazy landscape with some buildings and trees.

# WHITEHEAD

## AIRCRAFT

GEORGE WATSON  
1917

**RICHMOND**  
SURREY



**WOODSIDE ENGINEERING COMPANY, LTD.,  
POSSILPARK, GLASGOW.**

---

# **AEROPLANE TIERODS**

: IN :

**STREAMLINE AND ROUND SECTIONS**

COMPLETE WITH

**UNIVERSAL OR FORK JOINTS**

**LARGE STOCKS.**

---

**PROMPT DELIVERY.**

---

**Telephones.**

**WORKS: 1495 Douglas (2 lines.)**

**OFFICE: 3456 Central (3 lines.)**

(Private Branch Exchange.)

**Telegrams: "FUSELAGE," GLASGOW.**

**Registered Office**

**50 WELLINGTON STREET,  
GLASGOW.**



“ “ **CONTRACTORS TO “ “**  
**HIS MAJESTY'S WAR OFFICE**

*Messrs. Gordon Watney & Co. Ltd*

**AERONAUTICAL AND  
GENERAL ENGINEERS  
South Lodge Motor Factory  
WEYBRIDGE**



**Telephones WEYBRIDGE 550 (7 lines),      Telegrams: "MERCEDES, WEYBRIDGE."**



# AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER

## The British Aircraft Industry.

(SECOND SERIES.)

BY R. P. HEARNE.

### VII.—THE MOSS GEAR COMPANY, LIMITED.

I can almost hear some old-timer asking "What the Potsdam has Moss Gear got to do with aviation?" He will not be enlightened or appeased even when I tell him to leave out the Moss and just ponder on the importance of gearing, for really very few people attach much importance to gearing even when they understand the meaning of the term.

To put the matter in simple form it may be said that gearing is employed to transmit motion, and in the petrol motor a great deal depends on the various gears utilised. If the old-timer aviator sniffs with contempt at the petrol engine and all its box of tricks, then I can only tell him to flap his old wings himself and see how he likes it.

#### THE IMPORTANCE OF GEARING.

Of course he must come back to us, and take the petrol engine with all its tricks and gears. And if he wants a really successful engine he must be sure that the gear cutting work for it has been the best possible. Let him but inspect a modern aircraft engine and note the various trains of gears which carry out vital functions; and let him see a modern camshaft in the making and he will realise that when I deal with a firm specialising in gear cutting, I am concerned with a highly important branch of the great aircraft industry.

#### THE TEACHING OF EXPERIENCE.

Since 1913 the Moss Gear Company has been engaged in producing gearing for aeronautical engines, and long before the war broke out they were occupied on highly intricate work for important clients, whom I need not specify. So valuable was this work that in the very week that war broke out there came a big rush of orders which enabled this firm to get a flying start, so to speak, on war work.

To-day the Moss Gear Company has a greatly enlarged factory, where they carry out accurate gear cutting, the making of cam shafts, and precision machining for air engines on a huge scale, and I doubt if any other country in the war is better served in this respect. When one bears in mind how much the life and efficiency of the engine depends on its valve and other gearing, one will understand how firms like the Moss Gear Co. contribute to the success of British aerial engines.

#### THE MAN FROM YORKSHIRE.

The founder and guiding spirit of this enterprise is a York-

shireman, Mr. W. Duckett, and a very short acquaintance with him impresses on one his energy, determination and shrewdness, and, at the same time, indicates his good nature, his sense of humour, and other qualities which are needed in the founder of a new industry.

As indicative of how Mr. Duckett lives up to his character, I may mention that he keeps in particularly close personal touch with his workers.

His factory, heated and driven by electricity, is planned on the most modern lines, and there is a well-managed canteen attached. As a further instance of the relationship between directors and workers I might mention that this month a committee of the "hands" have, of their own accord, arranged a theatre party, to which they have invited the workers, the work's staff, and the Directors!

#### THE ROLLING STONE.

Turning now to the personal history of the man who founded this industry, I find that Mr. Duckett, though he has been something of a rolling stone, was born in Moss!—that being the name of his native village. And though he rolled about to good advantage, until he set up his factory in 1911, he had still such an attachment for Moss (or Moss for him), that he applied its name to the new company. Thus are traditions happily upset.

#### SOME PERSONAL HISTORY.

To specialise in gear cutting, and set up a factory for it in 1911, a man required a very varied experience, and here we find circumstances equipping Mr. Duckett for his future career.

If Yorkshiremen are not born dog fanciers or canary tutors, they are naturally engineers or something else quite as useful and difficult. Mr. Duckett set out as an engineer, and he served his apprenticeship to a firm of Corliss engine builders. After passing through various depart-

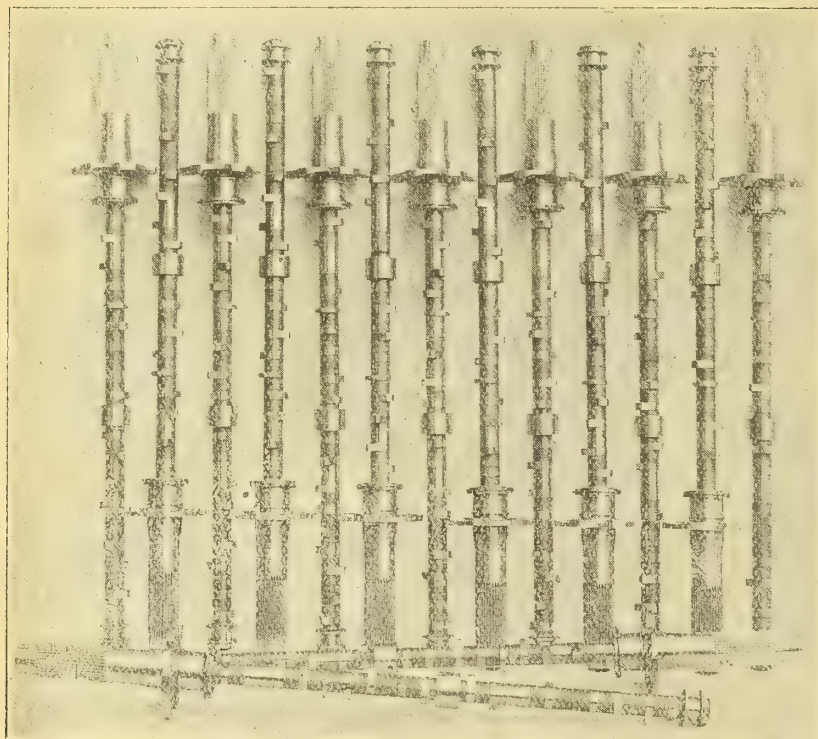
ments of this firm he joined the works staff of Walker Bros., of Wigan, now the builders of a well-known commercial vehicle.

Then he drifted south and eventually got a responsible post on the works staff of the Austin Motor Co. I happen to know the Austin factory pretty well, and I have known its founder Sir Herbert Austin since the primitive days of motoring. So I can say that Mr. Duckett could not have made a better choice of practical school in which to finish his education in motor engineering, and at the same time learn how to organise and run a factory.



MR. W. DUCKETT.





Some Products of the Moss Gear Works.

## MACHINE-TOOL EXPERIENCE.

Mr. Duckett's next step was to accept the post of machine tool salesman for the firm of Taylors (B'ham), Ltd. This task brought him all over Great Britain, and gave him an intimate knowledge of engineering requirements. He saw the opening for a firm which would specialise in high-class gear cutting, and when the opportunity arose he took the step which to-day has placed him at the head of a fine factory, doing very important national work.

## EARLY MOTOR DAYS.

His personal interest in mechanical locomotion has been very keen since the day, some twenty years ago, when a friend of his brought the first de Dion motor tricycle to Yorkshire, and allowed Mr. Duckett to have a trial trip on it. From that period his heart was set on the problem of mechanical locomotion.

It is very curious how the locomotive engineer turns to motoring and thence to aviation, and I should like to know if stationary engine enthusiasts ever turn to aviation direct. I

hardly think so; and when we have our aeronautical colleges some day, I hope that the curriculum will proceed on the lines of first making the boys good cyclists; next expert motor cyclists; then good all-round motorists, and thus lead them naturally to the way of the air.

## UNDAMPED ENTHUSIASM.

It was one of the great days of his life when Mr. Duckett purchased his first motor-cycle, in the days long before registration numbers were known. He bought the machine in Leicestershire, and unskilled though he was, his immediate purpose was to ride home to his native village of Moss. Nearing Doncaster, with full speed on, he suddenly discovered a flock of sheep pouring out from a gateway not far ahead, and filling the roadway.

There was no time to bring the machine to a halt, and Mr. Duckett was borne full tilt into the woolly assembly. One member was converted into emergency mutton: the machine was completely wrecked, and Mr. Duckett was brought home for overhaul and repair, three doctors being employed on the job. As a first experience in motor locomotion this was calculated to put many a man off the pursuit for the rest of his life, and I am sure that not a few wisecracks in the village of Moss told our subject to give up the craze.

Luckily for our air-engines of to-day he did not. As soon as the necessary personal repairs allowed he was back at the pastime again, with his Yorkshire doggedness, and to this day motor cycling remains his chief hobby.

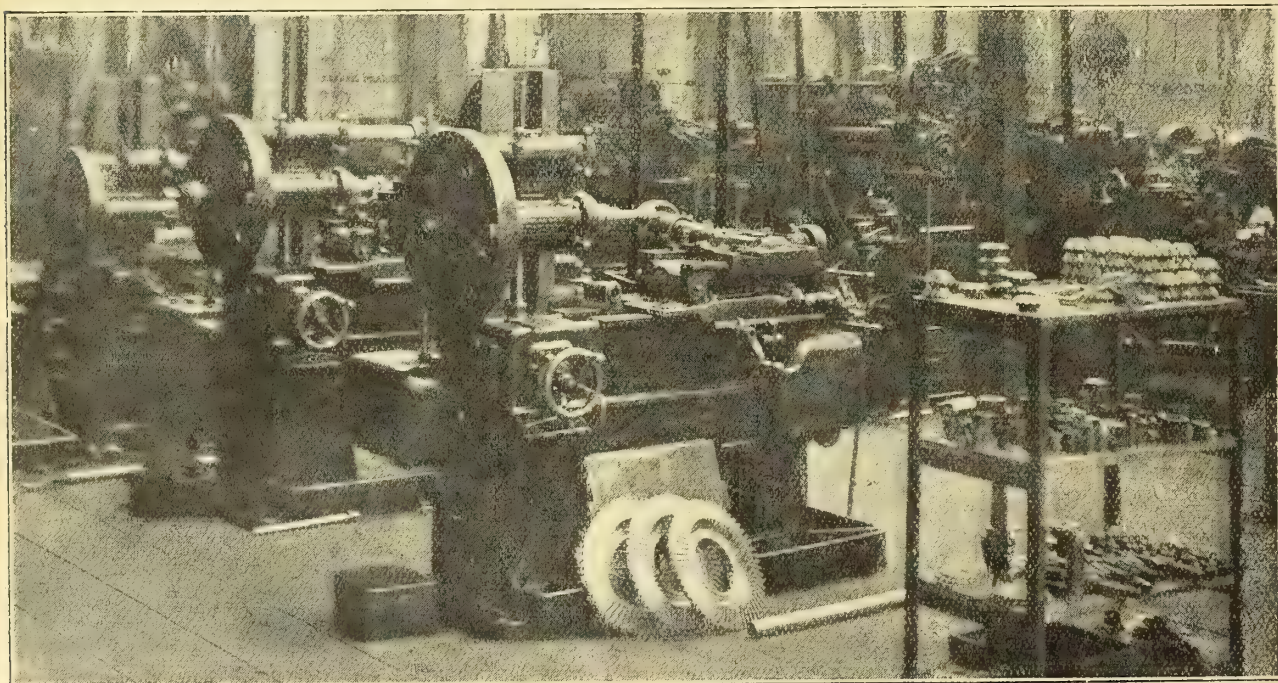
## FIRST ACQUAINTANCE WITH FLYING.

He has been interested in aviation since the Lanark meeting, and as a sound engineer he soon realised how great was the need of high efficiency work in connection with aerial engines. Looking at the early engines with their feeble and erratic motors he saw, as most other intelligent people at the time did, that the engine was the very heart of the whole affair, and until a high degree of power and, above all, a high degree of reliability were attained in these engines, no great headway could be made in aerial locomotion.

## CATCHING THE TIDE.

Mr. Duckett, when he got his first contract for aeronautical work several years before the war, realised that this class of job called for an even higher degree of accuracy than he had set up for himself in other work. But instead of letting the new business pass from him, or, worse still, carrying it out according to the old standards, he set himself to master the new problems, by applying new standards of workmanship.

So great was his success in this direction that when still more intricate and complicated tasks were set before him (and



Part of the Machine Tool Plant of the Moss Gear Company.



# EMAILLITE

NON-POISONOUS

AEROPLANE DOPE.

*THE ORIGINAL AND STILL THE PREMIER.*

AS  
TIGHT



AS  
A DRUM.

*Trade Mark.*

**THE BRITISH EMAILLITE CO., LTD.,**

*Contractors to the Air Board.*

Registered Offices:

**30, Regent Street, Piccadilly, S.W.1.**

Wire—"Ridleyppren Piccy, London."

"Phone—280 Gerrard

Works

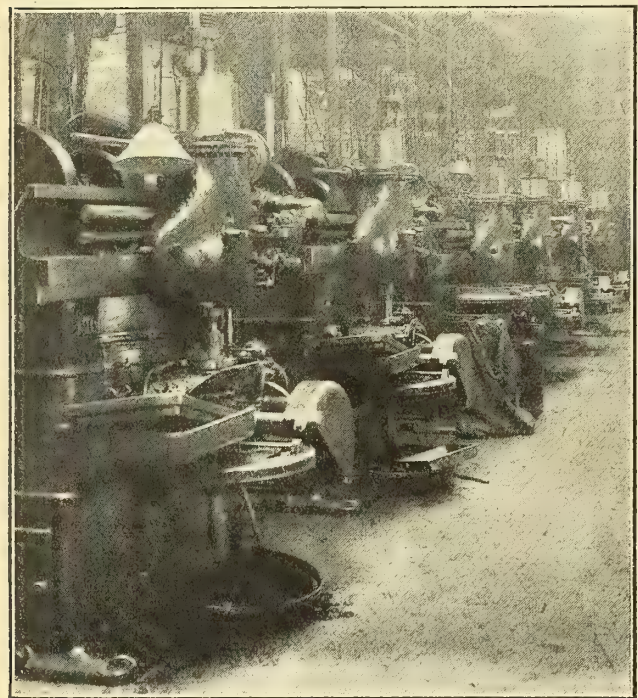
**5, Hythe Road, Cumberland Park,  
Willesden Junction, N.W.10.**

Telephone—Willesden 2346 & 2347.

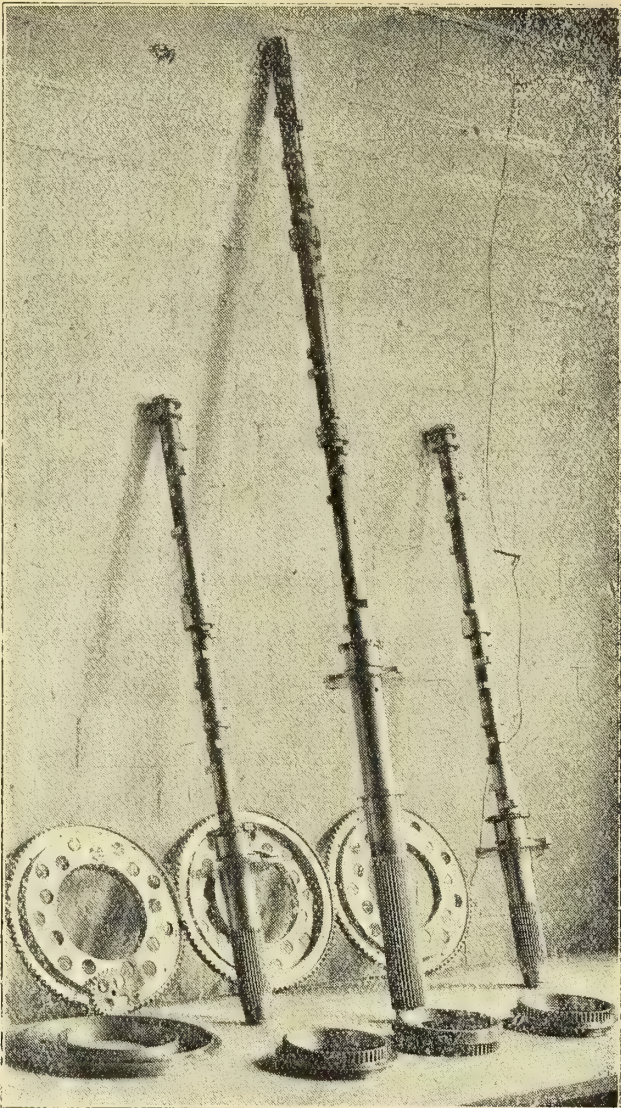


aerial engine designers *have* set some stiff tasks), he tackled them with characteristic determination, and thus made a reputation for his ability in this direction.

It is highly important for the efficiency of the main Aircraft Industry of this country that we should have the services of firms like the Moss Gear Co. to give the aid of specialists in the numerous intricate processes which go to the making of a first-class machine; and as long as we grow sturdy men of the Duckett type we can hold our own with all comers.



Some of the Moss Gear Co.'s Plant.



Varieties in Moss Gear Cutting.

**A HANDY REFERENCE TABLE.**  
The following table, published in "Aerial Age," New York, recently, will be found useful for reference when it is desired to estimate roughly the relative value of an engine of any new type.

CONSUMPTION AND WEIGHT COMPARISON OF TYPICAL 100-H.P. ENGINES.

Type of Engine.	Cooling.	Cylinders.	R.P.M.	Gasoline used per h.p. hour	Oil used per hour.	Weight Engine only.		Gasoline, Oil, and Tank, weight each.
						Per h.p.	Total	
Vertical	Water	6	1,300	0.55	0.3	5.4	540	63
Vee ...	"	8	1,800	0.61	0.8	5.1	510	77
Radial	"	7	1,250	0.63	0.5	4.8	480	74
Vee ...	Air ...	8	1,800	0.67	1.5	"	400	91
Radial	" ...	10	1,250	0.7	1.7	3.6	360	96
Rotary	" ...	9	1,200	0.8	.2	2.8	280	108

The weights of the water-cooled engines include the necessary radiator and cooling water. Radiator weight = 0.75 lb. per b.h.p. Cooling water weight = 0.3-0.5 lb. per b.h.p.

If the weight of all parts is not known, taking *E* as the weight of the engine in lbs., allow: Rotary engine mounting =  $\frac{1}{2} E$ ; stationary engine mounting =  $\frac{1}{12} E$ ; rotary engine cowling =  $2 \sqrt{E}$ ; stationary engine mounting =  $\sqrt{E}$ ; propellers = 2.5 *E*. Tanks =  $\frac{1}{5}$  wt. of contents. Gasoline = 7.2 lbs. per gal. Oil = 10 lbs. per gal.

**A WALL CALENDAR.**

In these days of restricted paper supplies the large lettered wall calendar has almost disappeared, but a few fortunate firms have secured a limited supply. Among them is J. Freeman, Sons, and Co., Ltd., Garratt Lane, Wandsworth, S.W.18, who announce that a few copies have been reserved for aircraft firms. Those interested are invited to apply.

**EFFICIENT FRICTION DRIVES.**

The use of "Don" friction fabrics is reported to be increasing at a rapid rate—due no doubt to their high standard of excellence and quality. The demand comes from some of the largest users of brake and clutch linings in the United Kingdom.

In view of the business already being done and of the great developments expected by Hays, Hunter, and Standen, Ltd., who market "Don"—and who already have large orders in hand, and pending for the Indian, South African, and colonial markets—it has been found necessary during the course of the past year to more than double the number of looms used for manufacturing the "Don" friction fabrics.

The fabrics are woven from 100 per cent. pure asbestos yarn, with or without the addition of brass wire. After the weaving "Don" fabric is treated by special methods of impregnation which renders it impervious to the effects of frictional or other heat, and prevent its braking properties being in any way affected by contact with grease, oil, and water.

**TRIPLEX TESTIMONIALS.**

The Triplex Safety Glass Company have issued an interesting booklet which gives some insight into the manufacture and use of Triplex Safety Glass for all manner of purposes.

Among other interesting illustrations are some photographs of five-ply Triplex glass which proved to be immune to Mark VII Service ammunition fired from a Service rifle at a range of 300 yards.

Numerous testimonials are also published from aviators who have worn Triplex Safety Glass goggles in bad smashes, when the non-breaking nature of the glass prevented injury to the wearers' vision.

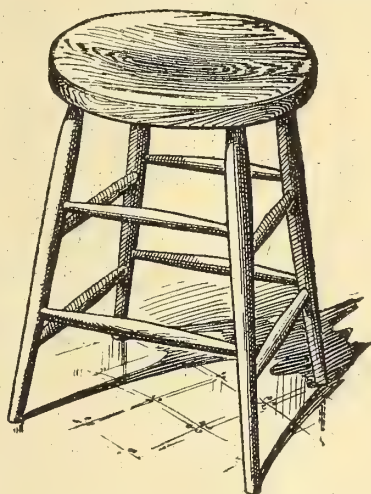
Readers of THE AEROPLANE who are interested in this subject are invited to apply to the Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1., for a copy of this booklet, a limited number being available for distribution.



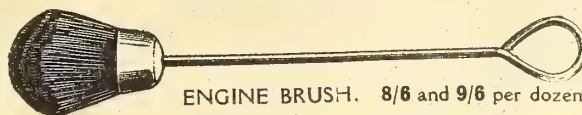


## For Immediate Delivery.

We can supply large quantities from stock of "Ascol" Specialities here illustrated. Send us your requirements:



FACTORY STOOL (Wood).  
24 in. high 6/6 each



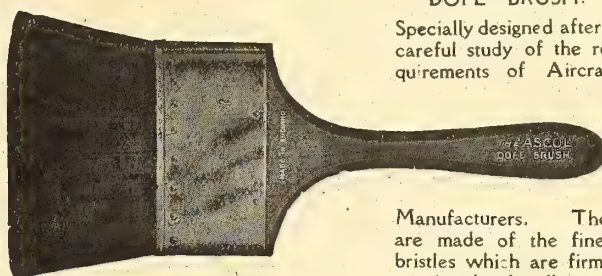
ENGINE BRUSH. 8/6 and 9/6 per dozen.



MOP BRUSH. 4/2 per dozen.

### "ASCOL" DOPE BRUSH.

Specially designed after a careful study of the requirements of Aircraft

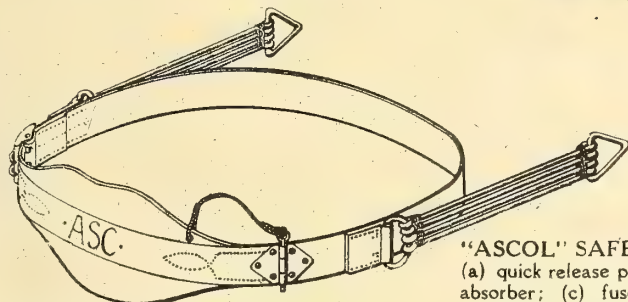


Manufacturers. They are made of the finest bristles which are firmly set in the handles.  
2 in 2/6, 3 in 4/-, 4 in 5/- each.

### "ASCOL" MICROMETERS

Have the following important qualities—accuracy, legibility, adjustability, simplicity, strength and value.

30/- and 32/6 each.



"Ascol" Leaflets. We have now ready illustrated descriptive leaflets dealing with "Ascol" Specialities. These include Micrometers, Factory Stools, Dope Cans, Dope Brushes, File Cleaners etc. We should be glad to send these to you, free of cost, in a neat case, upon application.

### "ASCOL" SAFETY BELTS

(a) quick release pin; (b) shock absorber; (c) fuselage fitting; (d & e) quick release fitting; (f) release cord; (g, h & i) leather belt, as supplied to the Norwegian and Japanese Governments.

42/- each.



### SCRATCH BRUSHES.

4 row Scratch Brushes (for burnishing) 16/- per dozen.

For full particulars of these and other items see "Aircraft Supplies our Fortnightly House Journal." Sent free to the Aircraft Industry on application on business stationery.

## THE AIRCRAFT SUPPLIES COMPANY LTD

CONTRACTORS TO THE AIR BOARD.

Head Offices, Showrooms, and Stores:

ASCOL HOUSE, 125 LONG ACRE, LONDON, W.C.2.

Representatives in Birmingham, Manchester, Leeds, Belfast, Northern Counties and Scotland, South Coast and the London District.

Managing Director:  
G. H. MANSFIELD

Works:  
Little James St.  
London, W.C.1.



Telephone:  
Gerrard 276.  
(Private Branch Exchange.)

Telegrams:  
"Upcast, Rand,"  
London.



## The Progress of a Pioneer Firm.

Those who remember the early days of flying will be interested to learn something of the progress of the pioneer firm now known as Martinsyde, Ltd., but better known to the old-timers as the partnership of Messrs. Martin and Handasyde. The gallant struggle put up by the partners in the days when a shed at Brooklands was the greatest ambition of any aeroplane maker in history. Despite continued hard luck with their machines, they maintained their high reputation for the best class of workmanship. And despite consistent neglect by the Services they held to their belief in high-speed machines and fixed-cylinder engines.

None of their competitors of those days will quarrel with the statement that the big Martinsyde monoplanes with Antoinette and Austro-Daimler engines were the handsomest aeroplanes ever produced in this country, and the most beautifully built. Even the final blow of the death of Mr. Gustav Hamel, when the machines which were being built for his attempt on the trans-Atlantic flight were almost finished, and the heavy financial loss to the partners entailed by the consequent withdrawal of his financial backers, did not cause Messrs. Martin and Handasyde to forsake their faith in their designs, and their method of manufacture.

When war broke out they were about the last firm to be set on their feet with Government orders, but when they were finally recognised as potential producers of war aeroplanes it did not take them long to attain to their proper place in the very front rank of the world's aeroplane constructors.

Their first war machines were small single-seater scouts with 80-h.p. Gnome engines. Though not so fast or light as some others, they were very popular with the R.F.C. on account of their strength and reliability. The pilots had full confidence in their construction, which meant much in those early days of the war, when less was known about the stresses put on active-service machines than is the case to-day.

Following these came a long series of bigger biplanes with Beardmore engines, in the design of which the experience gained with the fixed-engine monoplanes proved of the highest value. These machines, familiarly known as "The Elephant," did excellent service. Their speed and climb was good, the construction not only maintained but increased the firm's reputation for workmanship, and the consequence was the need for a great expansion of the firm's capacity for output.

Of succeeding types it is not yet permissible to write, but one may safely say that the latest products are record-breakers in every respect, as regards performance, construction, and fighting quality. This fact will be peculiarly gratifying to those who have long admired the pluck and pertinacity of Messrs. Martin and Handasyde.

The writer had recently the opportunity of visiting the firm's various workshops, and certainly there is nowhere to be found a finer example of efficiency and good organisation. One may not, obviously, say how many hands are employed, but it is safe to say that they run into hundreds, where in the early days of the firm's war contracts they were numbered in tens.

One particularly striking fact about the Martinsyde works is the relatively small number of men employed who are of military age, and the large proportion even of that number who are discharged soldiers and assorted "crocks" of various kinds. The proportion of women workers is very high. Taking these facts into consideration, the maintenance of the firm's high standard of workmanship is all the more creditable to the management.

The new works are of the most modern design, well lighted, well warmed, airy and healthy, so that the hands work under the best possible conditions. An excellent canteen has been established for those who cannot get home for meals, and, from what one learns of it, it seems that it is considerably more satisfying to feed in the Martinsyde canteen than in any West End hotel, or in any aristocratic house in London, quite apart from the fact that the aircraft workers have no house-keeping worries and no wasting of time through standing in queues. For the further welfare of the workers who come from a distance, certain neighbouring mansions have been taken over and turned

into hostels, where the people will live permanently, or will only leave when going home for the week-end. The arrangements in hand for these hostels indicate positive luxury, doubtless well deserved by those who produce war aircraft, and do their work willingly.

The chiefs of the firm, Mr. H. P. Martin and Mr. G. Handasyde, certainly deserve the success which has at last come to them, and, be it said, though they personally were always among the hardest workers in the old laborious days at Brooklands, they work harder to-day in their efforts to produce the best of war aircraft than they did even in the days when they were endeavouring to coax machines off the ground.

The success of the firm has happily included the success of those who worked so loyally with the partners in their days of trial. Mr. Trott now occupies a very responsible position as general assistant to the Directors, and his work is as highly valued now, and as indefatigably executed, as in the days when he laboured from dawn to dark on the old monoplanes. Mr. Sherwin is now works manager, and in this capacity has had to tackle the education, not only of the workmen and girls out of the foremen and charge hands, up to the high standard of workmanship on which the firm insists. One has only to look at the way the new Martinsydes are built to see that he has succeeded completely, and that the share which he took in the partners' work in the bad days of aviation is now bearing full fruit. And in charge of the erecting shop, a full-grown factory itself so far as size is concerned, one finds Mr. John, also one of the little band which slaved in the old sheds at Brooklands for the love of their work, and not for what they could get out of it.

In those days all the people concerned with flying were actually fighting a genuine war, not only in taking the risks of flying but by sacrificing well-paid jobs in other trades for the sake of their faith in aviation. They were as heroic, physically and morally, as the men who threw up their jobs and enlisted three years ago to fight Germany, and they fought equally for the future good of the human race and for human progress. Therefore, of all those who have come into their own through the war, the aircraft people are the best entitled to their position, more so even than those who have risen from civilian positions to high rank as soldiers in the field, for the aircraft people showed their foresight and faith before the war and have held to their beliefs ever since.

Martinsyde, Ltd., have been singularly fortunate also in those who have come to strengthen the firm's staff since the war began. In Mr. Hamilton Fulton, co-director with the original partners, the firm has a business man of proved ability and foresight, whose knowledge of affairs has been of the highest value. In Mr. T. B. André, formerly one of the best-known men in the motor trade, they have found a chief of the supply department whose previous experience has been a continual source of strength. And one must add Mr. F. P. Raynham, formerly entirely concerned with Avros, but now devoting much of his time to testing Martinsydes. Mr. Raynham is generally reckoned, along with Mr. Hawker and Captain Bell, the most brilliant of our experimental pilots, for, be it remembered, an experimental pilot is much more than a tester, and must be something of an engineer and a designer as well. It is recognised by the firm that Mr. Raynham's skill and experience has been of very high value to them and so to the R.F.C. and to the Army. Altogether one was happy to find that despite its enormous growth the people at the head of the firm are as much a happy family as when the whole business and all its work-people inhabited premises at Brooklands which could well be stowed in the firm's present board-room.

There are some people who are spoiled by success, and of whom it is said that "they cannot stand corn." There are others who cannot fight against adversity, but who are excellent so long as they are succeeding. The Martinsyde partners belong to neither category, they are the same as they always were, hard workers, brilliantly clever designers, very much in earnest, thoroughly sound engineers, and as optimistic as ever as to the ultimate fate of aviation. Long may they continue to uphold the credit of the pioneers of British aviation.—C. G. G.

### PATENTS INDEX.

The subjoined list of recent inventions has been specially compiled by THE AEROPLANE from the current Official Patents Records.

- Albrecht, P. A. Aerial torpedoes, and throwers therefor. No. 2289. Feb. 8th.  
 Anderson, G. Direction indicator for aeroplanes. No. 1995. Feb. 4th.  
 Baillie, R. Level indicators for aircraft. No. 2218. Feb. 7th.  
 Bain, T. Aeroplanes. No. 2284. Feb. 8th.  
 Baker, F. J. Aerial machines without aerostats. No. 2079. Feb. 5th.

- Bleriot, L. Aeroplanes, etc. No. 2015. Feb. 4th.  
 Bolotoff, S. V. de. Means to receive strut ends in aeroplanes. No. 2106. Feb. 5th.  
 Bregon, E. Constant vertical for aircraft, ships, etc., applicable also as a steering compass. No. 2220. Feb. 7th.  
 Bickley, J. H. Clinometer for aircraft. No. 2346. Feb. 9th.  
 Clerget, Blin et Cie. Rotary and/or radial internal combustion engines. No. 2190. Feb. 6th.  
 Edwards, E. L. Instrument for showing lateral and longitudinal stability of aeroplanes. No. 1980. Feb. 4th.  
 Evans, E. G. Fore and aft and lateral tilt indicator for aeroplanes. No. 2291. Feb. 8th.





# CELLON

(NON-POISONOUS)

# DOPE

**CELLON LTD.,**  
**BROAD STREET HOUSE, E.C.2.**

TELEGRAMS—"AJAWB," LONDON

TELEPHONES—LONDON WALL, 5359, 3622,

**Contractors to H.M. Government.**



**NON-POISONOUS  
DOPE**

**TITANINE**



THE  
**BRITISH AEROPLANE  
VARNISH CO., LTD.**  
166, PICCADILLY, LONDON, W.1

Telephone . . . . . GERRARD 2312.  
Telegrams . TETRAFREE, PIGGY, LONDON.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# **GNÔME & LE RHONE ENGINE COMPANY**

**Contractors to the  
War Office and Admiralty**

**London Offices :**

**27, BUCKINGHAM GATE, S.W.1., and THE HYDE, HENDON, N.W.9.**

**Works: Blackhorse Lane, Walthamstow.**



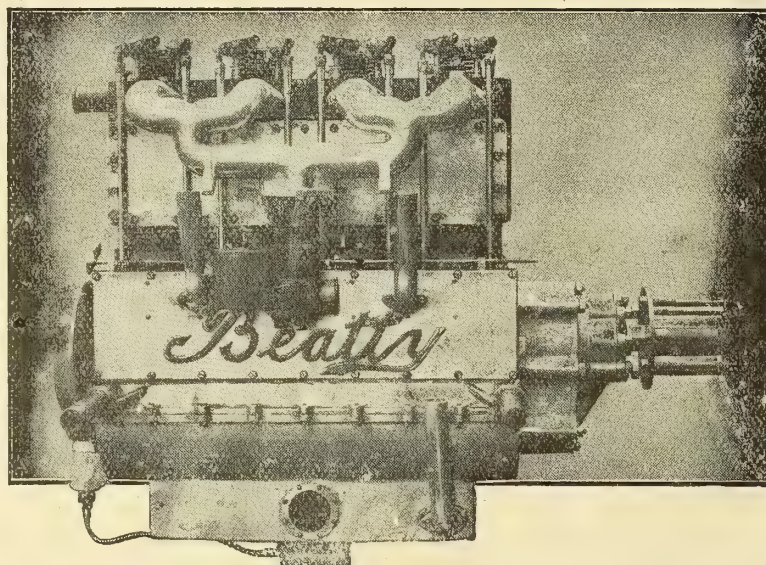
# The Beatty Monobloc Aero Engine

H.P. = 60.

R.P.M. = 1800  
Engine Shaft.

Prop. speed =  
1200 R.P.M.

Weight = 225 lbs



Petrol  
Consumption  
4.28 galls. per  
hour.

Oil  
Consumption  
.18 galls. per  
hour.

*Specially Designed and Developed for School Work.*

FULL  
PARTICULARS **The Beatty School of Flying Ltd.** LONDON  
AERODROME  
Telephone . . . . Kingsbury 138.

Contractors to H.M. Admiralty, War Office and Foreign Governments.

## The BRITISH CAUDRON CO., LTD.

SOLE BUILDING AND SELLING RIGHTS FOR

**Caudron Aeroplanes  
and Hydro-Aeroplanes**

FOR

**THE BRITISH EMPIRE AND DEPENDENCIES**

*Head Office and Works:*

**BROADWAY, CRICKLEWOOD, N.W.2.**

Cable and Telegraphic Address: "CAUDROPLAN, CRICKLE, LONDON." Phone: 4647 HAMPSTEAD  
4648

*Scottish Factory and Aerodrome:*

**ALLOA.**

Cable and Telegraphic Address: "CAUDROPLAN, ALLOA."

Phone: 52

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# The "Guardian Angel" Parachute



THE REAL

## "GUARDIAN ANGEL" PARACHUTE

is now included amongst the exhibits at

**THE IMPERIAL WAR EXHIBITION at Burlington House.**

### INADVERTENTLY

the Exhibition Committee had displayed and catalogued a Service parachute of the Ordinary type as a "Guardian Angel" Parachute. Flying men who had not seen the "Guardian Angel" Parachute were puzzled at this exhibit, as they had expected to see something quite different from the Service pattern, with which most of them were familiar. The opportunity is now given of comparing the two equipments in detail.

The "Guardian Angel" Parachute, in all its different types, is instantly automatic in its opening; its parts are under absolute control, at rest and in action; entanglement of its rigging is rendered physically impossible; there is no **free-fall**; shock to the Aviator and Parachute is prevented; it is the only Parachute which can be dropped with precision and safety from an Aeroplane flying at any speed; the harness instantly releases the Aviator on landing or falling into water.

**The Ordinary Service parachute possesses none of these advantages.**

**GO AND SEE BOTH AND JUDGE FOR YOURSELF.**

**RELIABILITY—First.    RELIABILITY—Second.    RELIABILITY—ALL THE TIME.**

**E. R. CALTHROP'S AERIAL PATENTS, LTD.**

**ELDON STREET HOUSE, ELDON STREET, LONDON, E.C.2.**

Telephones (2 lines): London Wall 3266 and 3267.

Telegraphic and Cable Address: "Savemalivo-Ave-London."

Telephone:—1992 HAMMERSMITH (3 lines).



**CONTRACTORS TO H.M. GOVERNMENT.**

**Designers and Manufacturers of all Types  
of Aircraft for Overland and Oversea  
- - Purposes, Flying Boats, etc. - -**

**Managing Director:**

**W. EWART CHESTER, F.R.G.S.**

**Consulting Engineer:**

**H. B. MOLESWORTH, M.I.C.E.**

Aviation Works & Offices - 229-231, Hammersmith Road, W.  
Engineering Works - King Street, Hammersmith.  
Airscrew Works - Ravenscourt Park, W.



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



## Urgent Requirements.

### MATERIAL WANTED.

Offers required for the following:—

PLYWOOD,  $\frac{1}{16}$ ",  $\frac{3}{32}$ ",  $\frac{1}{8}$ ",  $\frac{3}{16}$ ",  $\frac{1}{2}$ ",  $\frac{3}{4}$ ",  $\frac{1}{2}$ ",  $\frac{3}{8}$ "

ALL TYPES OF METAL FITTINGS,

ALUMINIUM DIE CASTINGS,

and HOT BRASS STAMPINGS

for AVRO 504 J Biplanes.



**THE GRAHAME-WHITE AVIATION CO., LTD.**  
AERONAUTICAL ENGINEERS.

### NOTICE

To DeH.6. Contractors.

We can supply *ex* STOCK  
BLANKINGS for all Metal Parts  
and AXLES complete.

Special developments of the following:—

Parts Nos. 9485	} Three blankings per set.
" " 9488	

Telephone:—Kingsbury 120 (5 lines).

Telegrams:—Volplane, Hyde, London.

**THE LONDON AERODROME, HENDON, N.W.9**

Proprietors of the London Aerodrome and the Grahame-White School of Flying.

*Non-Flame  
Celluloid*

Phone Central 1306 & 1307  
Telegrams "GREENBERG" LONDON

**GREENHILL & SONS**  
8 WATER-LANE LUDGATE-HILL  
LONDON. E.C. 4



# ALUMINIUM CASTINGS

OF EVERY DESCRIPTION.

We make a  
Speciality  
of  
Aeronautical  
and  
Automobile  
Work.

We are making many thousands of **Aluminium Die Castings** weekly under the celebrated **Cothlas** process—in many cases **entirely eliminating** machining operations, and we hold the sole manufacturing rights in the British Empire for this process.

Chemical and Physical tests are made on our own premises, and our **Castings**, both **Sand** and **Die**, are produced under the most up-to-date and scientific methods.

Sole makers of the **Birmal Aluminium Pistons**, thousands of which are running to-day in a highly satisfactory manner under the most severe conditions.

Highest  
Class  
Castings to  
Government  
Specifications.  
Prompt  
Delivery.

## BIRMINGHAM ALUMINIUM CASTING (1903) CO., LD.

Cambridge Street Works, BIRMINGHAM.

## HANDLEY PAGE LTD.

CONTRACTORS TO  
THE ADMIRALTY  
AND WAR OFFICE

CRICKLEWOOD,  
LONDON, N.W.2.

HAMPSTEAD 7500 (9 lines).

"HYDROPHID, CRICKLE," LONDON





# The Aeroplane

## Acceptance and Experimental Flights—

The Procter Isaac Aviation Co., "Aeromonia, Piccy, London. Gerrard 278 (2 lines).

## Acetylene Welding Plant—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.  
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

## Aeroplane Manufacturers—

Aircraft Manufacturing Co., Ltd., Hendon. "Airmanship, Hyde, London." Kingsbury 180.

Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle-on-Tyne. "Armstrong Aviation, Newcastle-on-Tyne." Gosforth 500.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

British & Colonial Aeroplane Co., Ltd. (The Bristol Co.), Filton, Bristol. "Aviation, Bristol." Bristol 3906.

British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudronplan, Cricklewood, London." Hampstead 5551.

Central Aircraft Co., Palmerston Works, High Road, Kilburn, N.W.6. "Aviduction, Phone, London." Hampstead 4403 and 4404.

Davidson Aviation Co., Ltd., Hammersmith, W.6. Hammersmith 1144-1145.

Eastbourne Aviation Co., Ltd., Eastbourne. "Aircraft, Eastbourne." Eastbourne 1176.

Graham-White Aviation Co., Ltd., London Aerodrome, Hendon. "Volplane, Hyde, London." Kingsbury 120.

Handley Page, Ltd., 110, Cricklewood Lane, N.W.2. "Hydrophid, Cricklewood, London." Hampstead 7420.

Hooper & Co., Ltd., 54, St. James St., Piccadilly, London, S.W. "Sociable, St. James, London." Regent 012.

Mann, Egerton & Co., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Martinsyde, Ltd., Brooklands, Byfleet. "Martinsyde, Weybridge." Woking 331; Byfleet 171.

National Aircraft Co., Ltd., 15, Hackney Road, N.E.2. "Nieuport & General Aircraft Co., Cricklewood, London, N.W.2. "Nieu Scout, Cricklewood, London." Willesden 2455.

Norman-Thompson Flight Co., Ltd., Bognor. "Soaring, Bognor." Bognor 48.

The Regent Carriage Co., Ltd., 126/127, New King's Road, Fulham, S.W.6. "Carbodies, London." Putney 2240-2241.

Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester." City 8530-8531, Manchester.

Saunders, S. E., Ltd., East Cowes, I.O.W. "Consuta, East Cowes." Cowes 193.

Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tested, Phone, London." Regent 378.

Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston." Kingston 744.

Standard Aircraft Manufacturing Co., Effingham House, Arundel Street, W.C.2. "Gunsignrush, Estrand, London." City 89.

Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickerflyta, Knights, London." Kensington 6810.

Waring & Gillow, Ltd., Hammersmith. "Warisen, Ox, London." Museum 5000.

Westland Aircraft Works, Yeovil. "Aircraft, Yeovil." Yeovil 129.

White, J. Samuel, & Co., Ltd., East Cowes. "White, East Cowes." Cowes 3.

Whitehead Aircraft (1917), Ltd., Richmond Surrey. "Whitecraft, Richmond, Surrey." Richmond 1865.

Wycombe Aircraft Constructors, Ltd., High Wycombe, Bucks. "Aircraft, High Wycombe." High Wycombe 84.

## Airships—

Airships, Ltd., High Street, Merton. "Short Bros., Rochester, Eastchurch, and Whitehall House, S.W. "Tested, Phone, London." Regent 378.

## Aluminium Castings (Sand & Die)

Coan, R. W., 219, Goswell Road, London, E.C.1. "Krankas, Isling, London." City 2846.

## Bearings (Etonia Cast Phosphor Bronze)—

Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds." Central 3927.

## Brass Sheets for Tipping Propellers—

Pritt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fen, London." Avenue 995, 996, and 7906.

## Buildings—

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

Palmer, T. W., & Co., Church Road, Merton Abbey, Surrey. "Wimbleton 1313.

Runsey Owen & Co., Darlaston, South Staffs. The Willey Co., Ltd., Salisbury House, London Wall, E.C.2. "Wrathless, Phone, London." City 268.

## Cable Coverings and Cable Controls—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Capstan Work—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Carburettors—

Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.1. Victoria 4670.

## Casein—

Nieuwhof, Surie & Co., Ltd., 5, Lloyd's Avenue, London, E.C.3. "Suricondo, Fen London." Avenue 34 and 35.

## Castings—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Castings (Aluminium, Brass, Bronze, Machined or Rough)—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Celluloid (Non-Flam.)—

Greenhill & Sons, 8, Water Lane, E.C. "Greenberg, London." Central 1306-7.

London Label Co., Beckton Road, E.16. "Londabel, Canning, London." East 1300.

## Clothing—

Burberry's, Ltd., Haymarket, S.W.1. Regent 2165.

Dunhill's, Ltd., Euston Road, N.W.1. "Dunhill, London." North 3405-6.

## Component Parts—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines).

B. D. V. Aircraft Spares, Syon Chambers, 164, Kew Road, Richmond, Surrey. "Aeros, Richmond." Richmond 1681.

Central Aircraft Co., Palmerston Works, High Rd., Kilburn, N.W.6. Hampstead, 4728.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

The Aircraft Construction Co., Harley Works, Beckton Road, E.16. "Aeracracons, Canning, London." East 1300.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

## Cords, Tapes, and Threads—

MacLennan, J., & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.

## Dopes—

British Aeroplane Varnish Co., Ltd., 166, Piccadilly, W.1. "Tetrafree, Piccy, London." Gerrard, 2312.

British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellutate, London." Regent 4046.

The British Emallite Co., Ltd., 30, Regent Street, S.W.1. "Ridleyren, Piccy, London." Gerrard 280.

Cellon, Ltd., Broad Street House, New Broad Street, E.C.2. "Ajawb, London." London Wall 5350-3622.

Clark, Robert, Ingham & Co., Ltd., Walter House, Bedford Street, Strand, W.C. "Pearline, Westrand." Regent 3923.

## Electrical Accessories—

Belling & Co., Derby Road Works, Montague Road, Upper Edmonton, N.18. "Belling, Edmonton." Tottenham 1984.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207, London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Eusroad, London." Museum 70.

Premier Electric Heaters, Ltd., 258, 259, and 360, Bradford Street, Birmingham. "Fahrenheit, Birmingham." Midland 681.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

## Electric Cables—

E. Kalker & Co., Coventry. "Kalker, Coventry." Coventry 24x.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207, London Wall 1564.

## Electric Lighting and Power—

E. Stanley Fardon, A.M.I.E.E., 67, Mosley Street, Manchester.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207, London Wall 1564.

## Engines and Parts—

Allen, W. H., Son & Co., Ltd., Queen's Engineering Works, Bedford. "Pomp, Bedford." Bedford No. 1.

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

The Beatty School of Flying, Ltd., The Broadway, Cricklewood, N.W.2. Hampstead 3000.

Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London." Gerrard 238.

Dudbridge Iron Works, Ltd. (Salmson), 87, Victoria Street, London S.W.1. "Aero-flight, Vic, London." Vic 7026.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

Gordon Watney & Co., Ltd., Weybridge. "Mercedès, Weybridge." Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham. Richmond 1893.

Gwynnes, Ltd., Hammersmith Iron Works, Hammersmith, W. "Gwynne, Hammersmith." Hammersmith 1970.

Napier & Son, D., Ltd., 14, New Burlington Street, London, W., and at Acton, W. "Nitrifier, London." Gerrard 626.

Robertson, J. H., & Co., 1, Albemarle Street, London, W.1. Regent 3006.

Rolls-Royce, Ltd., 14 and 15, Conduit St., W.1. "Rolhead, London." Gerrard 1644-46.

The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. Regent 1181.

Sturtevant, B. F., Co., Ltd., Hyde Park, Boston, U.S.A. Wolverhampton 985.

Sunbeam Motor Car Co., Ltd., Wolverhampton. "Moorfield, Wolverhampton." Wolverhampton 985.

The Gnome & Le Rhône Engine Co., Ltd., 47, Victoria Street, S.W. "Elevenfold, London." Walthamstow 408 (2 lines).

## Flare Lights—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

## Flexible Shafts—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Flying Schools—

Bournemouth Aviation Co., Ltd., Talbot Village, Bournemouth. "Etches, Winton." Bournemouth 1160.

Cambridge School of Flying and Aerodrome Co., 308, St. Andrews St., Cambridge. "Carbon, Cambridge." Cambridge 5 and 1086.

## Furniture (Office)—

Cooke's (Finsbury), Ltd., Finsbury Pavement House, London, E.C.2. London Wall 573 and 6179.

## Galvanising—

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

The Rustless Iron (Copper Coles Process), Ltd., 1, French St., Sunbury-on-Thames, Middlesex. Sunbury 37.

## Gears—

Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham." East 407.

## Glue—

Central Chemicals, Ltd., 283, West End Lane, London, N.W.6. "Entramical, Westham, London." "Excroiden." Wapping, London. Avenue 3178.

Mendine Co., 8, Arthur Street, E.C. Bank 5873.

Oldroyd, Wm., & Sons, Ltd., 9, Mincing Lane, E.C.3.

## Goggles—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

## Heating and Ventilating—

Chas. P. Kinnell & Co., Ltd., 65 & 65a Southwark Street, London, S.E.1. "Kinnell, London." Hop 372 (2 lines).

## Hollow Spars—

McGruer Bentwood Hollow Spar Co., Commercial Wharf, Lambeth, S.E. "Gabrielson, Watloo, London." Hop 718.

Robert Young's, Construction Co., Ltd., Canonbury Works, Canonbury Street, Essex Rd., London, N.1.

## Instruments—

British Wright Co., Ltd., 33, Chancery Lane, W.C.2. Holborn 1308.

## Instruments (Scientific, Altimeters, etc.)—

The Cambridge Scientific Instrument Co., Ltd., Cambridge. "Instrument, Cambridge." Cambridge 642.

Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, Phone, London." Walthamstow 180.



# Buyers' Guide.



## Machine Tools—

Brewster & Co., 11, Queen Victoria Street, E.C.4. "Circumfuse, Cannon, London." City 768.

## Magneto Driving Pieces—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Magnetos—

The M.L. Magneto Syndicate, Ltd., Victoria Works, Coventry. "Corlton, Coventry." Coventry 1008-1009.

The British Lighting & Ignition Co., Ltd., 204, Tottenham Court Road, W.1. "Vicks-mag, Phone, London." Museum 430.

Eriesson Manufacturing Co. (Berling Magneto), Buffalo, N.Y., U.S.A.

## Metal Manufacturers—

Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 42-43.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

## Metals in General—

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Pritt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Pen, London." Avenue 905, 906, and 7006.

Samuel Mercer & Co., 198, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

## Metal Parts and Fittings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

Aircraft Supplies Co., Ltd., Ascol House, 125, Long Acre, W.C.2. "Upcast, Rand, London." Gerrard 276 (2 lines).

Arnott & Harrison, Ltd., Hythe Road, Willesden Junction, Willesden 2207.

Bayliss, Jones & Bayliss, Ltd., Wolverhampton. (Bolts and Nuts.) "Bayliss, Wolverhampton." Wolverhampton 1041.

The Birmingham Guild, Ltd., 45, Gt. Charles Street, Birmingham. "Handicraft." Central 3705.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

The British Gold Shell Ring Co., Ltd., Inverness Road, Hounslow, London. "Golshel, Hounslow." Hounslow 254.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Euston, London." Museum 70.

Mountford, Fredk., Ltd., Fremo Works, Lifford, Birmingham. "Fremo, Birmingham." Kings Norton 261.

Robertson, J. H., & Co., 1, Albemarle Street, London, W.1. Regent 3906.

Rubery, Owen, & Co., Darlaston South Staffs.

Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66.

The Pulvo Engineering Co., Ltd., 10, to 16, Dane Street, High Holborn, London, W.C.1. "Pulvipult, Phone, London." Holborn 410.

The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. Regent 1181.

The Aircraft Construction Co., Harley Works, Beckton Road, E.16. "Aeracracons, Canning, London." East 1300.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston." Bilston 10.

Wooler Engineering Co., Ltd., Old Oak Common Lane, Willesden Junction, N.W.10.

## Metal Shearing Tools—

Montgomery, Smith, & Co., Ltd., Tangent Works, Keynsham, near Bristol. "Ingenuity, Saltford." Keynsham 21.

## Metal Spinnings—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Metric Bolts—

Cashmore Bros., Zota Works, Hildreth Street, Balham, S.W. Battersea 415.

Rubery Owen & Co., Darlaston, South Staffs.

## Miscellaneous—

Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast." Belfast 4033-4034-4035.

Anti-Glare Glass Co., Ltd., 30, Wigmore Road, "Wingateise, London." Mayfair 2353.

Bowden Wire, Ltd., Willesden Junction, "Bowireline, Harles, London." Willesden 2400 (3 lines).

British Metal (Kingston), Ltd., Kingston-on-Thames.

Brown Bros., Ltd., Great Eastern Street, E.C.1. "Imbrowned, Bethrood, London." London Wall 6300.

Herbert Froud Co., Ltd., Chapel-en-le-Frith. "Frodrake, Birmingham." Central 793.

Endolithe Manufacturing Co., Ltd., 61½, Fore Street, London, E.C.2. Labels in Metal, Ivory, Ivorine, etc.

Glasso Manufacturing Co., Ltd., 211, City Road, E.C.2. City 9558.

London Label Co., Ltd., Harley Works, Beckton Road, E.16. "Nonflamoid," Non-flammable Celluloid. "Lonlabel, Canning, London." East 1300.

MacLennan, J., & Co., 30, Newgate Street, E.C.1, and at Glasgow. Tapes, Cords and Threads. City 3115.

## Motor Cars—

Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

Mann, Egerton & Co., Ltd., 379/381, Euston Road, London, N.W.1. "Manegecar, Euston, London." Museum 70.

Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 530 (4 lin. 3).

## Nameplates and Labels—

British Metal (Kingston), Ltd., Kingston-on-Thames.

Endolithe Manufacturing Co., Ltd., 61½, Fore Street, London, E.C.2.

The Clegg Metal Engraving Co., Chatsworth Works, Worthing. "Clegg Worthing."

## Observation Panels—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

## Parachutes—

E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemaivo, Ave, London." London Wall 3266-3267.

## Pattern Making—

Fredk. Ward, 6, 7 and 8, Allsop Street, Upper Baker Street, W. Padd 4743.

## Piston Rings—

British Chuck & Piston Ring Co., Coventry. "Rings, Coventry." Coventry 723.

## Power Presses and Dies—

Bliss, E. W., & Co., 29, Pocock Street, Blackfriars Road, London, S.E.1. "Blissdon, London." Hop 4340.

## Presswork—

Rubery Owen & Co., Darlaston, South Staffs. Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Propellers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames. "Ebora, Kingston." Kingston 672.

Integral Propeller Co., Ltd. "Avirop, Hyde, London." Hendon 9, Kingsbury 104.

Lang Propeller, Ltd., Weybridge. "Aerosticks, Weybridge." Weybridge 520-521.

Mann, Egerton & Co., Ltd., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Oddy, W. D., & Co., Leeds. "Aircscrews, Leeds." Central 291, Leeds.

Stanley Aviation Co., 67, Kingsland Road, E.2. City 8347.

Westland Aircraft Works, Yeovil. "Aircraft, Yeovil." Yeovil 129.

## Pyrometers—

The Foster Instrument Co., Letchworth, Herts. Foster Instruments, Letchworth. Letchworth 26.

## Rigging for Aircraft—

Craddock, Geo., & Co., Ltd., Wakefield, England. "Craddock, Wakefield." Wakefield 466 (3 lines).

## Rubber Tubing & Accessories—

Hancock, James Lyne, Ltd., 266, Goswell Road, London, E.C.1. "Masticator, Isling, London." City 3811 and 3812.

## Safety Belts—

Holmes, C. H., & Son, 38, Albert Street, Manchester. "Semloh, Manchester." City 4432.

## Screw-driving Machines—

Russell Bros. (Redditch), Ltd., Littleworth, Redditch. "Inventors, Redditch." Redditch 74.

## Seaplane Manufacturers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

Mann, Egerton & Co., Ltd., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

The Norman Thompson Flight Co., Ltd., Middleton, Bognor. "Soaring, Bognor." Bognor 48.

Short Bros., Rochester. "Seaplanes, Rochester." Chatham 627.

Supermarine Aviation Co., Ltd., Southampton. "Supermarine, Southampton." Southampton 1337.

## Searchlights and Landing Lights—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

## Seats for Aeroplanes—

Bowser, E., Art Cane Works, 50 Park Lane, Leeds. Central 3473.

## Shackles—

The British Gold Shell Ring Co., Ltd., Inverness Road, Hounslow. "Golshel, Hounslow." Hounslow 254.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

## Sheet Metal Pressings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

Blackburn Aeroplane and Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345.

W. H. Briscoe & Co., Ltd., 51 and 53, Park Street, Birmingham. "Brisk, Bham." Central 550.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

London Aluminium Co., Ltd., Westwood Road, Aston, Birmingham. East 497 Birmingham.

Rubery Owen & Co., Darlaston, South Staffs.

## Sheet Metal Work—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4870.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Rubery Owen & Co., Darlaston, South Staffs.

The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4870.

The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. Regent 1181.

Arthur Hill & Co., Silchester Road, North Kensington, W. Park 1443.

## Shock Absorbers (Elastic Cord)—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Sparking Plugs—

Lodge Sparking Plug Co., Ltd., Rugby. Igniter, Rugby. Rugby 235.

Ripault, Leo, & Co., Ltd. (Oleo Plugs), 64a, Poland Street, W.1. "Ripault, Reg, London." Gerrard 7758.

## Springs—

Dart Spring Co., West Bromwich. "Dart, West Bromwich." West Bromwich 322.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61 (3 lines).

## Stampings—

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

## Steel—

Firth, Thos., & Sons, Sheffield. "Firth, Sheffield." Sheffield 3230 to 3237.

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

Nicklin, Bernard, & Co., Birmingham. "Bernico, Birmingham." Smithwick 224.

## Steel Stamps and Markings—

John Meerloo & Sons, Cleveland Works, Cleveland Street, Mile End, E.1. "Dayhur, Phone, London." East 3331 (2 lines).

## Steel Tension Wires—

Craddock, Geo., & Co., Ltd., Wakefield, England. "Craddock, Wakefield." Wakefield 466 (3 lines).

## Steel Tubes for Aeroplanes—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

## Taper Pins—

Mountford, Fredk. (Birmingham), Ltd., Fremo Works, Lifford, Birmingham. "Fremo, Birmingham." King's Norton 261-262.

## Tapes and Smallwares—

Brown, Percy, & Co., 49, Newgate Street, London, E.C.1. "Ominate, Cent, London." City 4659.

MacLennan, John, & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.

James North Hardy & Son, Ltd., 54, Portland Street, Manchester. "Hardson, Manchester." Central 6471.

## Timber—

Engineering Timber Co., Ltd., 9, Victoria Street, London, S.W. "Entikosit, Vic, London." Victoria 5073, 4210.

Brown, R. F., & F. W., Wollaton Saw Mills, near Nottingham. "Brown's Saw Mills, Wollaton." Nottingham 1526.

J. Owen & Sons, Ltd., 100a, Borough High Street, S.E.1. "Bucheron, London." Hop 3811 (2 lines).

## BUYERS' GUIDE cont. on next page.







# The Aeroplane

# Buyers' Guide

## Acceptance and Experimental Flights

The Procter Isaac Aviation Co., "Aeromila, Picoy, London. Gerrard 278 (3 lines).  
Acetylene Welding Plant—  
Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London. Vic 430.  
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibac, Phone, London. 3540 Victoria (3 lines).

## Aeroplane Manufacturers

Aircraft Manufacturing Co., Ltd., Hendon. "Airmanship, Hyde, London.  
Kingsbury 188.  
Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle-on-Tyne. "Armstrong Aviation, Newcastle-on-Tyne. Gosforth 500.  
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds.  
Roundhay 345 (3 lines).  
Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich. Norwich 851.  
British & Colonial Aeroplane Co., Ltd., (The Bristol Co.), Filton, Bristol. "Aviation, Bristol. Bristol 3906.  
British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudron, Cricklewood, London. W.1. "Caudron, Cricklewood, London. W.1. "Caudron, Cricklewood, London. W.1.  
Central Aircraft Co., Palmerston Works, High Road, Kilburn, N.W.6. "Aviation, Phone, London. Hampstead 440 and 494.  
Davidson Aviation Co., Ltd., Hammermith, W.6. "Hammermith, 144-145.  
Eastbourne Aviation Co., Ltd., Eastbourne. "Aircraft, Eastbourne. Eastbourne 176.  
Graham-White Aviation Co., Ltd., Hampshire, Henden. "Aviation, Hyde, London. Kingsbury 220.  
Handley Page, Ltd., 110, Cricklewood Lane, N.W.2. "Hydroph, Cricklewood, London. Hampstead 720.  
Hooper & Co., Ltd., 54, St. James St. Piccadilly, London, S.W. "Sociable, St. James, London. Regent 412.  
MacLennan & Co., Aircraft Works, Norwich. "Motors, Norwich. Norwich 483 (4 lines).  
Marshall & Co., Ltd., Brooklands, Byfleet. "Marshall, Byfleet. Byfleet 171.  
National Aircraft Co., Ltd., 15, Hackney Road, N.E.2. "Aviation, London. Wall 6725.  
"Neuport" & General Aircraft Co., Cricklewood, London, N.W.4. "Neuscut, Cricklewood, London. Willensden 2455.  
Norman-Thompson Flight Co., Ltd., Bognor. "Searing, Bognor. Bognor 28.  
The Regent Carriage Co., Ltd., 156/157, 2nd King's Road, Fulham, S.W.6. "Carbodies, London. Putney 2240-2241.  
Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester. City 853-8531.  
Manchester. "Sunderland, S. E. Ltd., East Cotes, I.O.W. "Consults, East Cotes. Cotes 193.  
Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tested, Phone, London. Regent 378.  
Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston. Kingston 744.  
Standard Aircraft Manufacturing Co., Effingham House, Arundel Street, W.C.2. "Gunship, Effingham, London. City 89.  
Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickerly, Knights, London. Kensington 6810.  
Waring & Gillow, Ltd., Hammermith, "Warren, Oe, London. Museum 596.  
Westland Aircraft Works, Yeovil. "Aircraft, Yeovil. Yeovil 129.  
White, J. Samuel & Co., Ltd., East Cotes. "White, East Cotes. Cotes 193.  
Whitehead Aircraft (1917) Ltd., Richmond Surrey. "Whitcraft, Richmond, Surrey. Richmond 1885.  
Wycombe Aircraft Constructors, Ltd., High Wycombe, Bucks. "Aircraft, High Wycombe. High Wycombe 84.

## Airships

Airships, Ltd., High Street, Merton. "Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tested, Phone, London. Regent 378.  
Aluminium Castings (Sand & Die) Cast. R. W., 216, Goswell Road, London, E.C.1. "Kranke, Ising, London. City 1846.

## Bearings (Etonia Cast Phosphor Bronze)

Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds. Central 3937.

## Brass Sheets for Tipping Propellers

Pitt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fen, London. Avenue 995, 996, and 7005.

## Buildings

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich. Norwich 851.  
Palmer, T. W., & Co., Church Road, Merton Surrey. "Palmer, Merton. Merton 1313.  
Rumy & Owen & Co., Darlaston, South Staffs. The Willey Co., Ltd., Salisbury House, London Wall, E.C.4. "Wraiths, Phone, London. 297.  
Cable Coverings and Cable Controls—  
Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch. Redditch 61.  
Capstan Work—  
Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham. Central 1223.  
Carburettors—  
Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.1. Victoria 4570.

## Casins

Nieuwhof, Surie & Co., Ltd., S. Loyds Avenue, London, E.C.3. "Suricodon, Fen, London. Avenue 34 and 35.

## Castings (Aluminium, Brass, Bronze, Machined or Rough)

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham. Central 1223.  
Celluloid (Non-Flam.)—  
Greenhill & Sons, S. Water Lane, E.C. Greenhill & Sons, Ltd., London. Central 1306-7.  
London Label Co., Beckton Road, E.16. "Label, Canning, London. East 1300.

## Clothing

Dunhill's, Ltd., Euston Road, N.W.1. "Dunhill, Euston. North 3405-6.

## Component Parts

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury. Oldbury 111 (4 lines).  
B. D. Y. Aircraft Spares, Spens Chambers, 46, New Road, Richmond, Surrey. "Aero, Richmond. Richmond 1687.  
Central Aircraft Co., Palmerston Works, High Rd., Kilburn, N.W.6. Hampstead 4728.  
"Aviation, Phone, London. W.1.  
Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham. Central 733 (3 lines).  
The Aircraft Construction Co., Harley Works, Beckton Road, E.16. "Aerconics, Canning, London. East 1306.  
Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros. Bilston. Bilston 102.

## Cords, Tapes, and Threads

MacLennan, J., & Co., 30, Newgate Street, E.C.1. and at Glasgow. City 3145.

## Dopes

British Aeroplane Varnish Co., Ltd., 166, Piccadilly, W.1. "Tetrafree, Piccy, London. East 497.  
British Cellulose Co., S. Waterloo Place, S.W.1. "Cellulose, London. Regent 496.  
The British Enamel Co., Ltd., 30, Regent Street, S.W.1. "Ridley, Piccy, London. Gerrard 280.  
Cellon, Ltd., Broad Street House, New Broad Street, E.C.4. "Ajaw, London. East 1306.  
Clark, Robert, Ingham & Co., Ltd., Watling House, Bedford Street, Strand, W.C. "Pearline, Westrand. Regent 3923.

## Electrical Accessories

Belling & Co., Derby Road Works, Montague Road, Upper Edmonton, N.18. "Belling, Edmonton. Tottenham 3084.  
Johnston & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London. Central 2207, London Wall 1564.  
Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Euston, London. Museum 70.  
Premier Electric Heaters, Ltd., 238, 239, and 300, Bradford Street, Birmingham. "Fahrenheit, Birmingham. Central 1223.  
The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rotax, Phone, London. Willensden 2450.

## Electric Cables

E. Kallier & Co., Coventry. "Kallier, Coventry. Coventry 245.  
Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London. Central 2207, London Wall 1564.

## Electric Lighting and Power

E. Stanley, London, A.M.I.E.E., 67, Mosley Street, Manchester. Central 2207, London Wall 1564.

## Engines and Parts

Allen, W. H., Son & Co., Ltd., Queen's Engineering Works, Bedford. "Pump, Bedford. Bedford 10.  
Arnold-Johnson, Ltd., Dumfries. "New, Dumfries. Dumfries 28-29.  
The Beauty School of Flying, Ltd., The Broadway, Cricklewood, N.W.2. Hampstead 1200.  
Beardmore Aero Eng. Ltd., 119, Great Portland Street, W.1. "Beardmore, Phone, London. Gerrard 238.  
Dunbridge Iron Works, Ltd. (Salmon), 47, Victoria Street, London S.W.1. "Aero, High Wycombe. High Wycombe 84.  
Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham. Central 733 (3 lines).  
Gordon Watney & Co., Ltd., Weybridge. "Mercedés, Weybridge. Weybridge 550 (7 lines).  
Green Engine Co., Ltd., Twickenham. "Green, Twickenham. Richmond 1293.  
Gwynnes, Ltd., Hammermith Iron Works, Hammermith, W.1. "Gwynne, Hammermith, 1910.  
Napier & Son, D. W., 14, New Burlington Street, London, W. "and at Aston, W. "Nitrifer, London. Gerrard 1616.  
Robertson, J. H., & Co., 1, Albemarle Street, London, W.1. "Regent 3906.  
Rolle-Kayser, Ltd., 14 and 15, Conduit St., W.1. "Rolled, London. Gerrard 1643-4.  
The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. "Selsdon, Kingsway. Regent 181.  
Sturtevant, B. F., Co., Ltd., Hyde Park, Boston, U.S.A. "Sturtevant, Hyde Park. Boston. U.S.A.

## Flare Lights

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibac, Phone, London. 3540 Victoria (3 lines).

## Flexible Shafts

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch. Redditch 61.

## Flying Schools

Bournemouth Aviation Co., Ltd., Talbot Village, Bournemouth. "Etches, Winton. Winton 160.  
Cambridge School of Flying and Aerodrome Co., 30, St. Andrews St., Cambridge. "Carb, Cambridge. Cambridge 5 and 1066.

## Furniture (Office)

Cooke's (Finsbury), Ltd., Finsbury Pavement House, London, E.C.2. "Cooke's, Finsbury. London Wall 573 and 679.

## Galvanising

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich. Norwich 851.  
The Rustless Iron (Copper Cores Process), Ltd., 1, French St., Sunbury-on-Thames, Middlesex. Sunbury 37.

## Gears

Most Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mogear, Birmingham. East 497.

## Glue

Central Chemicals, Ltd., 263, West End Lane, London, N.W.6. "Entramical, Westham, London. East 1300.

## Improved Liquid Glues Co., Ltd., Gt. Hermingway Street, E. (Grid). "Exedon, Wipp, London. Avenue 3178.

## Membie Co., & Arthur Street, E.C. Bank 5873.

## Oldred, Wm., & Sons, Ltd., 9, Mincing Lane, E.C.3.

## Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterly, Piccadilly, W.1. Regent 1340.

## Heating and Ventilating

Chas. P. Kinnell & Co., Ltd., 65 & 69 Southwark Street, London, S.E.1. "Kinnell, London. Hlop 372 (2 lines).

## Hollow Spars

McGuire Bentwood Hollow Spar Co., Commercial Wharf, Lambeth, S.E. "Gabriel, London. East 1306.

## Robert Young's Construction Co., Ltd., Cannonbury Works, Cannonbury Street, Essex Road, N.1.

## Instruments

British Wright Co., Ltd., 33, Chancery Lane, W.C.2. "Wright, Chancery Lane. W.C.2.

## Instruments (Scientific, Altimeters, etc.)

The Cambridge Scientific Instrument Co., Ltd., Cambridge. "Instrument, Cambridge. Cambridge 619.

## Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aeroid, Phone, London. Walthamstow 120.

## Machine Tools

Brewer & Co., 11, Queen Victoria Street, E.C.4. "Circumloc, Cannon, London. City 768.

## Magneto Driving Pieces

Harley Terry & Sons, Ltd., Redditch. "Springs, Redditch. Redditch 61.

## Magnetos

The M. Magneto Syndicate, Ltd., Victoria Works, Coventry. "Carlton, Coventry. Coventry 1008-1009.

## Metal Manufacturers

Clifford, C. & Sons, Ltd., Birmingham. "Clifford, Birmingham. Central 42-43.

## Metal Parts and Fittings

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury. Oldbury 111 (4 lines).

## Aircraft Supplies Co., Ltd., Asol House, 125, Long Acre, W.C.2. "Upjohn, Rand, London. Gerrard 276 (3 lines).

## Smith & Harrison, Ltd., Hythe Road, Willesden Junction, W.1. "Willesden, W.1. Willesden 2207.

## Bay, Jones & Bayliss, Ltd., Willesden Junction, (High and Nuts). "Bayliss, Willesden Junction. Willesden 2207.

## The Birmingham Guild, Ltd., 45, Gt. Charles Street, Birmingham. "Handcraft, Birmingham. Central 773.

## Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds. Roundhay 345 (3 lines).

## The British Gold Shell Ring Co., Ltd., Inverness Road, Hounslow, London. "Goldshell, Hounslow. Hounslow 254.

## British Metal (Kington), Ltd., Kingston-on-Thames. "Kington, Kingston. Kingston 550.

## Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. "Cleveland, Avenue 1432.

## Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Euston, London. Museum 70.

## Mountford, Fredk., Ltd., Fremo Works, Lifford, Birmingham. "Fremo, Birmingham. Kings Norton 261.

## Robertson, J. H., & Co., 1, Albemarle Street, London, W.1. "Regent 3906.

## Rubery Owen & Co., Darlaston, South Staffs. "Sanks, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sanks, Wellington. Salop. Wellington 46.

## The Puko Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.1. "Pulpulpi, Phone, London. Holborn 410.

## The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. "Selsdon, Kingsway. Regent 181.

## The Virex Construction Co., Harley Works, Richmond Road, E.16. "Aerconics, Canning, London. East 1306.

## The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rotax, Phone, London. Willensden 2450.

## Thompson Bros. Ltd., Bradley, Bilston. "Thompson Bros, Bilston. Bilston 102.

## Water Engineering Co., Ltd., Old Oak Common Lane, Willesden Junction, N.W.10.

## Metal Shearing Tools

Montgomery Smith & Co., Ltd., Tangent Works, Keynsham, near Bristol, Glos. "Montgomery, Keynsham. Keynsham 21.

## Metal Spinnings

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham. Central 1223.

## Cashmore Bros., Zota Works, Hildreth Street, Wilton, W.1. "Cashmore, Wilton. Wilton 129.

## Rubery Owen & Co., Darlaston, South Staffs. "Motors, Norwich. Norwich 483 (4 lines).

## The Norman Thompson Flight Co., Ltd., Middleton, Bognor. "Searing, Bognor. Bognor 28.

## Supermarine Aviation Co., Ltd., Southampton. "Supermarine, Southampton. Southampton 1337.

## Searchlights and Landing Lights

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibac, Phone, London. 3540 Victoria (3 lines).

## Endothine Manufacturing Co., Ltd., 614, Fore Street, London, E.C.4. Labels in Metal, Ivory, Iverine, etc.

## Glasco Manufacturing Co., Ltd., 211, City Road, E.C.1. City 9558.

## London Label Co., Ltd., Harley Works, Beckton Road, E.16. "Nonflamm, Nonflammable Celluloid. East 1398.

## MacLennan, J., & Co., 30, Newgate Street, E.C.1. and at Glasgow. Tapes, Cords and Straps. City 3145.

## Motor Cars

Arnold-Johnson, Ltd., Dumfries. "Mocar, Dumfries. Dumfries 28-29.

Mann, Egerton & Co., Ltd., 379/381, Euston Road, London, N.W.1. "Mannegear, Euston, London. Museum 70.

Standard Motor Car Co., Coventry. "Flyward, Coventry. Coventry 530 (4 lines).

## Nameplates and Labels

British Metal (Kington), Ltd., Kingston-on-Thames. "Kington, Kingston. Kingston 550.

Endothine Manufacturing Co., Ltd., 614, Fore Street, London, E.C.4. "Labels, Fore Street, London, E.C.4.

The Clegg Metal Engraving Co., Chatsworth Works, Worthing. "Clegg Worthing. Worthing 143.

## Observation Panels

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterly, Piccadilly, W.1. Regent 1340.

## Parachutes

E. R. Cudlipp's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemaliva, Ave, London. London Wall 346-3467.

## Pattern Making

Fredk. Ward, 6, 7 and 8, Allsop Street, Upper Baker Street, W. "Padd 4743.

## Piston Rings

British Chuck & Piston Co., Coventry. "Kings, Coventry. Coventry 723.

## Power Presses and Dies

Bliss, E. W., & Co., 29, Piccadilly Street, Blackfriars Road, London, S.E.1. "Bliss, London. Hlop 4349.

## Presswork

Rubery Owen & Co., Darlaston, South Staffs. Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch. Redditch 61.

## Propellers

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds. Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich. Norwich 851.

Ebor & Prother, Co., 11 & 12, Surbiton Terrace, Kingston-on-Thames. "Ebor, Kingston. Kingston 672.

Integral Propeller Co., Ltd., "Aviprop, Hyde, London. Hendon 9. Kingsbury 193.

Lang Propeller, Ltd., Weybridge. "Aerotics, Weybridge. Weybridge 520-521.

Mann, Egerton & Co., Ltd., Aircraft Works, Norwich. "Motors, Norwich. Norwich 483 (4 lines).

Oddy, W. D., & Co., Leeds. "Aircrover, Leeds. Central 291, Leeds.

Stanley Aviation Co., 67, Kingsland Road, E.2. "Yeovil, Yeovil. Yeovil 129.

## Pyrometers

The Foster Instrument Co., Letchworth, Letchworth. "Foster Instruments, Letchworth. Letchworth 26.

## Rigging for Aircraft

Craddock, Geo., & Co., Ltd., Wakefield, England. "Craddock, Wakefield. Wakefield 466.

## Rubber Tubing & Accessories

Hancock, James Lyne, Ltd., 266, Goswell Road, London, E.C.1. "Masticator, Ising, London. City 3811 and 3812.

## Safety Belts

Holmes, C. H., & Son, 38, Albert Street, Manchester. "Smiths, Manchester. City 4439.

## Screw-driving Machines

Russell Bros. (Redditch), Ltd., Littleworth. "Redditch, Redditch. Redditch 74.

## Seaplane Manufacturers

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds. Roundhay 345 (3 lines).

Mann, Egerton & Co., Ltd., Aircraft Works, Norwich. "Motors, Norwich. Norwich 483 (4 lines).

The Norman Thompson Flight Co., Ltd., Middleton, Bognor. "Searing, Bognor. Bognor 28.

Supermarine Aviation Co., Ltd., Southampton. "Supermarine, Southampton. Southampton 1337.

## The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rotax, Phone, London. Willensden 2450.

## Seats for Aeroplanes

Bowen, L. Art Cane Works, 30 Park Lane, Leeds. Central 3473.

## Shackles

The British Gold Shell Ring Co., Ltd., Inverness Road, Hounslow. "Goldshell, Hounslow. Hounslow 254.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rotax, Phone, London. Willensden 2450.

## Sheet Metal Pressings

Accles & Pollock, Ltd., Oldbury, Birmingham. "Acc



**The Aeroplane "Buyers' Guide.—continued.****Time Recorders—**

Gledhill-Brook Time Recorders, Ltd., 26, Victoria Street, S.W.1. Victoria 1310.

**Turnbuckles—**

Rubery Owen & Co., Darlaston, South Staffs.

**Tyres and Wheels—**

The Palmer Tyre, Ltd., Shaftesbury Avenue. "Tyricord, Westcent." Gerrard 1214 (5 lines)

**Undercarriages—**

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

**Varnishes—**

The British Emailite Co., Ltd., 30, Regent Street, S.W.1. "Ridleyppren, Piccy, London." Gerrard 280.

Clark, R. Ingham & Co., Walter House, Bedford Street, Strand, W.C. "Pearline, Westrand." Regent 3923.

Harland, W. & Son, Merton, London, S.W.19. "Harland, Wimbledon 45." Wimbledon 45 and 1395.

Naylor Bros., Ltd., Southall, Middlesex. "Naylor, Southall." Southall 30.

**Vices—**

C. and J. Hampton, Ltd., Sheffield. "Vices, Sheffield." Attercliffe 95.

**Washers—**

Guthrie, J. B. & Son, 30, St. Mary Axe, E.C.3. Herbert Terry & Sons, Ltd. Redditch. "Springs, Redditch." Redditch 61.

**Watchmakers and Jewellers (Silver Models)—**

Goldsmiths' & Silversmiths' Co., Ltd., 112, Regent Street, W.1. Gerrard 9091 (3 lines).

**Welding and Cutting Plant—**

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830. Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." 3540 Victoria (3 lines).

**Welding Repairs—**

Barimar, Ltd., 10, Poland Street, W.1. "Bariquamar, Reg, London." Gerrard 8173. The New Welding Co., 26, Rosebery Avenue, London, E.C.1. "Windoneeda, Holb, London." Holborn 5252.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London." 3540 Victoria (3 lines).

**Wind Shields—**

Auster, Ltd., 133, Long Acre, W.C. "Windeflector, London." Regent 5910.

London Label Co., Ltd., Hadley Works, Beckton Road, E.16. "Nonflamoid" Nonflammable Celluloid. "Lonlabel, Canning, London." East 1300.

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlyss, Piccy, London." Regent 1340.

**Wire Gauze—**

N. Greening & Sons, Ltd., 16, Finsbury St., London, E.C.2. "Setscrew, Finsquare, London." Wall 1082.

Guthrie, J. B. & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

**Wires and Cables (Aeroplanes)—**

Bruntons, Musselburgh, Scotland. "Wiremill, Musselburgh." Musselburgh 28.

Craddock, Geo., & Co., Ltd., Wakefield, England. "Craddock, Wakefield." Wakefield 466 (3 lines).

**Wirework—**

Terry Herbert & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

**Wood Refuse Suction Gas Producers—**

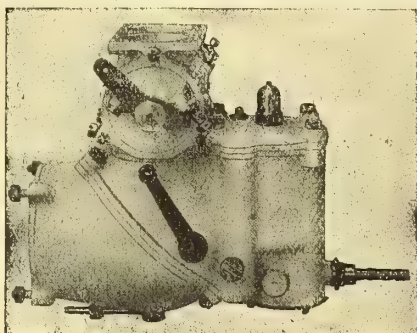
Ruston Proctor & Co., Ltd., Lincoln, England. "Ruston, Lincoln." Lincoln 580.

**Woodworking Machinery—**

Robinson, Thomas, & Son, Ltd., Railway Works, Rochdale. "Robinson, Rochdale." Rochdale 467.

Sagar, J., & Co., Ltd., Halifax. "Sawtooth, Halifax." Halifax 136.

Wadkin & Co., Leicester. "Woodworker, Leicester." Leicester 3614.



# Claud-Hobson

**CARBURETTORS**

Supplied to the Air Board  
— for Aeroplane Engines —

**H. M. HOBSON, LIMITED**

29 Vauxhall Bdg. Rd., London, S.W.1

## INCREASED OUTPUT DEMANDS GREATER ACCOMMODATION

To meet calls for accelerated production The  
**WILFLEY COMPANY** offers its services for  
the provision of Factory Buildings of all types in  
**STEEL, FERRO-CONCRETE, BREEZE  
SLABS, ASBESTOS SHEETS, BRICK**  
and other Construction.

*DESIGNS FOR COMPLETE FACTORIES IMMEDIATELY AVAILABLE.*

**TEMPORARY STRUCTURES A SPECIALITY.**

# The Wilfley Company, Limited

**SALISBURY HOUSE, LONDON WALL, E.C. 2.**

Telegrams : "Wrathless, Phone, London."

Telephones : City 2681 & 2682

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# WYCOMBE AIRCRAFT CONSTRUCTORS, LIMITED.

==  
HIGH WYCOMBE,  
BUCKS.  
==

Telephones : High Wycombe 84 (Stores : High Wycombe 120).  
Telegrams : "Aircraft, High Wycombe."

Telephones : DALSTON 872.

LONDON WALL 9766.

HAMPSTEAD 4768.

## Thames Aviation Works

(BURTON'S, LTD.)

**TWO COMPLETE MILL PLANTS AND TWO YEARS' EXPERIENCE.**

Addresses of our fine Saw Mills, Works, etc.,  
— have been camouflaged by the Censor. —

Offices only: 141, CURTAIN ROAD, E.C.

### CONSTRUCTORS OF COMPLETE AIRCRAFT

And all kinds of WOOD PARTS, WINGS, AILERONS,  
— STRUTS, LEVERS, RUDDERS, NACELLES, &c. —

### Specialities—BIG STUFF and BEST WORK.



# SAMUEL MERCER & CO.,

Telegrams RECONCILED CANNON, LONDON

Proprietor—S. T. MERCER.

Telephone CITY 6342.

## Metals

MILD STEEL SHEETS  
SPECN. S3 & 9A.  
Passed & Stamped A.I.D.

BEST CHARCOAL  
TINNED & LEAD  
COATED.

BLACK C/R and C/A  
SHEETS.

GALVD. SHEETS.

## Immediate

*Highest Prices given for*

198, UPPER THAMES ST., LONDON, E.C.4.



## for Aircraft.

BRASS AND COPPER  
SHEETS.

SOLDER. INGOTTIN.

WELDING WIRE.

COPPER BITS, ETC.

LARGE STOCKS IN OUR  
OWN WAREHOUSE.

## Deliveries.

*Brass and Copper Scrap.*

# NIEUPOORT

AND

## GENERAL AIRCRAFT COMPANY, L<sup>TD</sup>.

CONTRACTORS TO H.M. GOVERNMENT.

OFFICE AND WORKS—  
LANGTON ROAD,  
CRICKLEWOOD, LONDON, N.W.2

TELEPHONE (3 LINES)—  
WILLESSEN 2455

TELEGRAMS—  
NIEUSCOUT, CRICKLE, LONDON



# STEEL TUBING IN STOCK

TRADE MARK.



MEANS LONG LIFE

Get your Requirements at once.  
We have a very large quantity of  
 $\frac{3}{8}$  in. outside diameter by 10, 11,  
12, 13, 14 and 15 gauge, besides  
other small diameters.

This stock will not last long, and we  
advise buyers to send instructions  
immediately.

**The Steel Tube, Tubular Spanner & Presswork People.**

Telegrams:

"Accles,  
Oldbury."A.B.C. Code,  
5th Edition.

Telephones:

Oldbury, 111.

(4 Lines.)

OLDBURY,

BIRMINGHAM.



PROPELLER 1017

**OUR** works are equipped with all  
the most modern and up-to-date  
machinery for the economical manufac-  
ture of Engine Parts. We can undertake  
your requirements. Let us hear from you.

**The Aero Engine Components Company,**  
39, ST. JAMES'S STREET, LONDON, S.W.1.

Telegrams

407 and 408 Regent.



**The Hollow Structure and Aircraft Co., Ltd., Patent.**

## **WOOD PROBLEM SOLVED.**

# **HOLLOW SPARS**

And Struts for all types of machines.

**Any length, shape or section without joints.**

*FULL PARTICULARS FROM THE SOLE LICENSEES,*

**ROBERT YOUNG'S CONSTRUCTION CO., LTD.,**

AIRCRAFT CONTRACTORS,

**CANONBURY WORKS, ESSEX ROAD, LONDON, N.**

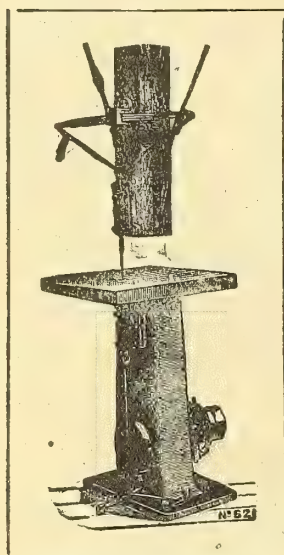
TELEPHONE—  
DALSTON 2985.

TELEGRAMS—  
BYLDINCONT NORDO LONDON."



## **FRET SAWING MACHINES**

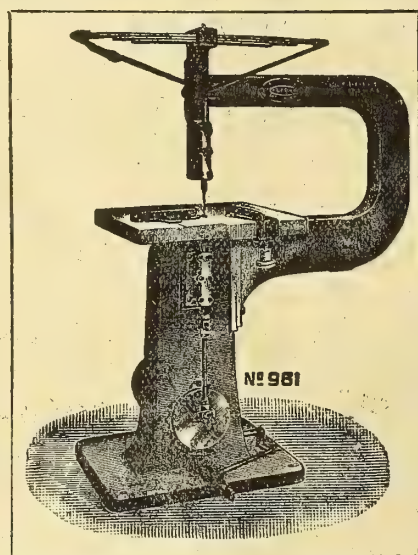
**Suitable for Aircraft Work.**



Made with Fixed or  
Canting Tables, and  
:: suitable Boring ::  
Apparatus if required.

Fuller particulars on  
request.

We make several other Wood  
Working Machines suitable for  
Aeroplane Builders, and shall be  
pleased to quote prices, etc., on  
receipt of enquiry.



**J. SAGAR & CO., Ltd.,** Sawmill Engineers, **HALIFAX, Eng.**  
Canal Works,  
**LONDON OFFICE: 60, Watling Street, E.C.**





SPECIALISTS IN ELECTRICAL TRANSMISSION AND DISTRIBUTION



*The Illustration shows a section of a 20,000 volt three-phase overhead*

## ELECTRIC POWER TRANSMISSION LINE

*lately completed by us for an outlying Government Mine.*

*The cheapest method of delivering power to Works, etc., in country districts.*

12, UNION COURT, OLD BROAD ST., LONDON, E. C. 2.

**JOHNSON AND PHILLIPS LTD**  
ELECTRICAL ENGINEERS & CABLE MAKERS  
**CHARLTON, LONDON, S.E. 7.**

BIRMINGHAM 208, Corporation St. CARDIFF 9, Park Place. GLASGOW 159, W. George St. MANCHESTER 251, Deansgate. NEWCASTLE-ON-TYNE 44b, Blackett St. PORTSMOUTH Cleveland Rd. Gosport.

## AIR BOARD STANDARD PETROL GAUZE.

WOVEN WIRE CLOTH  
IN ALL METALS AND  
IN ALL MESHES AND STRENGTHS.

MANUFACTURED BY  
**N. GREENING & SONS, LTD.** ESTABLISHED 1799.  
LONDON WAREHOUSE—  
**16 FINSBURY STREET, E.C.2.**

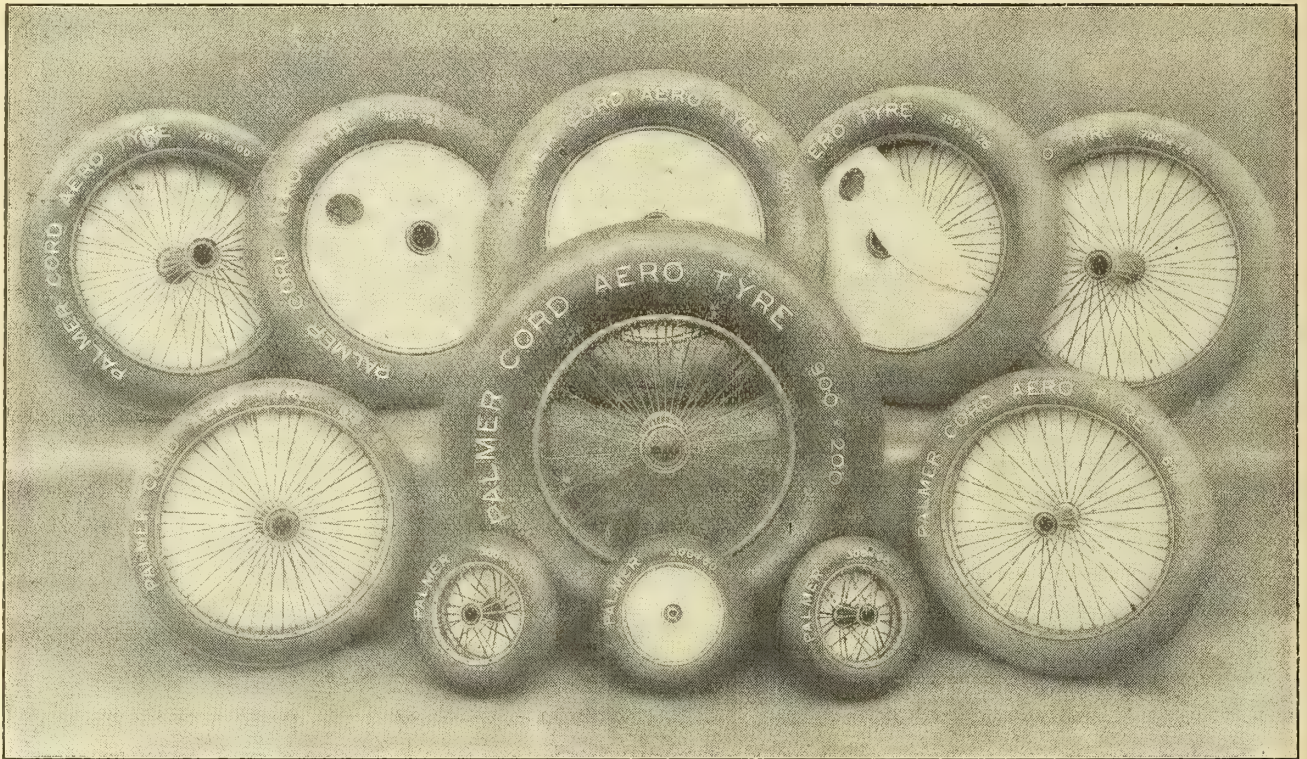
Telegrams—"SETSCREW, FINSQUARE, LONDON."  
Telephone No.—LONDON WALL 1082.

**WORKS - WARRINGTON.**



# PALMER

## LANDING WHEELS & TYRES



### STANDARD SIZES:

Tyre Sizes	Wheel No.	Hub		Track Line	Tyre Sizes	Wheel No.	Hub		Track Line	Tyre Sizes	Wheel No.	Hub		Track Line
		Length	Bore				Length	Bore				Length	Bore	
300 x 60	16	111.12	25.4	Central	700 x 75	*80	178.	44.45	132/46	750 x 125	96	178.	55.	132/46
"	17	72.39	12.7	Central	"	*91	178.	31.75	132/46	800 x 150	82	185.	55.	135/50
450 x 60	30	89.	31.75	Central	"	*98	178.	44.45	Central	"	85	185.	55.	Central
575 x 60	111	150.	38.09	104/46	700 x 100	92	185.	55.	135/50	"	+36	185.	55.	135/50
"	21	160.	28.	Central	"	95	185.	55.	Central	"	+40	185.	60.32	135/50
"	34	150.	31.75	104/46	"	77	178.	44.45	132/46	1000 x 150	97	250.	65.4	Central
650 x 65	78	178.	44.45	132/46	"	93	150.	40.	Central	"	102	185.	55.	125/60
"	100	178.	38.09	132/46	"	33	150.	38.09	Central	"	201	185.	60.32	125/60
"	101	178.	31.75	132/46	"	99	178.	38.89	132/46	900 x 200	39	185.	55.	Central
600 x 75	111	150.	38.09	104/46	750 x 125	92	185.	55.	135/50	"	42	185.	60.32	125/60
"	21	160.	28.	Central	"	95	185.	55.	Central	"	47	185.	55.	125/60
"	34	150.	31.75	104/46	"	77	178.	44.45	132/46	1100 x 200	52	185.	55.	116/69
700 x 75	78	178.	44.45	132/46	"	93	150.	40.	Central	"	57	185.	55.	Central
"	100	178.	38.09	132/46	"	33	150.	38.09	Central	"	203	185.	60.32	116/69
"	101	178.	31.75	132/46	"	99	178.	38.89	132/46	"	204	185.	60.32	Central

\*Wheels Nos 80, 91 and 98 are fitted with a wider and stronger rim, and the 700 x 75 tyres when fitted to this rim caliper 83 m/m.

†Wheels Nos. 36 and 40 are of stronger type than the other wheels for 800 x 150 tyres.

## THE PALMER TYRE LIMITED

Contractors to the Admiralty and to the War Office,

119, 121, 123, SHAFTESBURY AVENUE, LONDON, W.C.2.

Telegrams: "TYRICORD, WESTCENT, LONDON."

Telephone: GERRARD 1214 (Five lines).

PARIS: 24, Boulevard de Villiers, Levallois-Perret.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

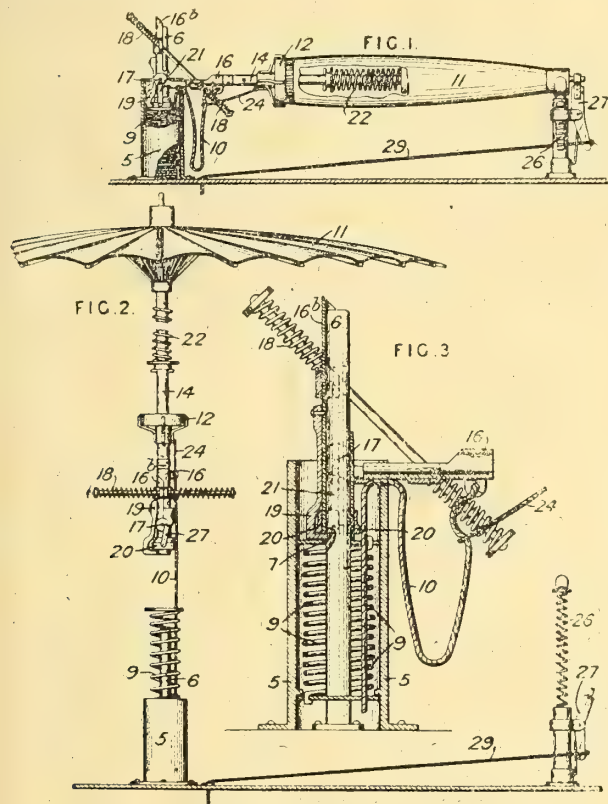


- Evans, E. G. Detachable petrol tank for aircraft. No. 2341. Feb. 9th.
- Fort, M., and Others. Treatment of scrap aeroplane fabrics, etc., and recovery and utilisation of products therefrom. No. 2365. Feb. 9th.
- Heste, A. van. Hangars or garages, etc. No. 2145. Feb. 6th.
- Hodges, G. Planes of flying-machines. No. 2369. Feb. 9th.
- Holt, H. E. S. Parachute flares. No. 2240. Feb. 7th.
- Long, W. Landing-gears for aeroplanes. No. 2036. Feb. 5th.
- Mahon, E. W. S. Aircraft height and range-finder. No. 2387. Feb. 9th.
- Mineard, A. G. Aerial range-finder. No. 2305. Feb. 8th.
- Pearson, C. Air-ships. No. 2160. Feb. 6th.
- Phillipson, J. Apparatus for indicating inclination of aeroplanes. No. 2181. Feb. 6th.
- Raymond, F. G. Propeller blades for aircraft. No. 2266. Feb. 7th.
- Rose, W. H. Valves for balloons, etc. No. 2099. Feb. 5th.
- St Armande, A. V. Process of treating aeroplane fabrics. No. 2141. Feb. 6th.
- Smith, F. Apparatus for silencing exhaust of aircraft engines. No. 2355. Feb. 9th.
- Thomas, W. Level indicators for aircraft, submarines, etc. No. 2170. Feb. 6th.
- Thornton, J. E. Aerial photography. No. 2065. Feb. 5th.
- Turner, T. B. Range-finder for aircraft. No. 2294. Feb. 8th.
- Winstanley, A. Method of defence against aircraft. No. 2282. Feb. 8th.
- Wright, H. L. Instrument for indicating when aeroplane in flight is horizontal. No. 1981. Feb. 4th.

## ABRIDGMENTS OF RECENTLY PUBLISHED SPECIFICATIONS.

- 111,802. Parachutes. MYERS, A. W., 252, Somerset Street, and FITZGERALD, R. R., 13, Slater Street, both in Ottawa, Canada. May 18th, 1917. No. 7158.

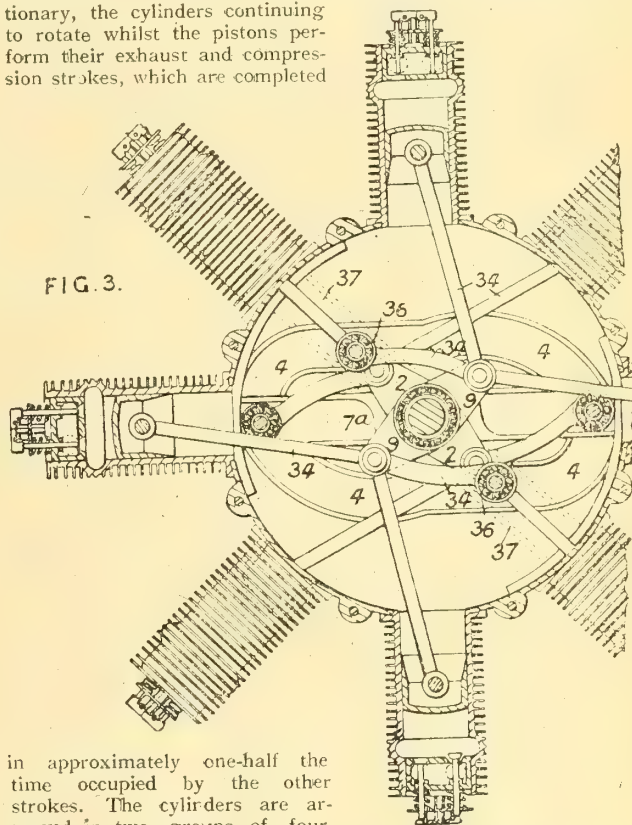
A parachute for attachment to aerial machines is normally held closed by a keeper 12 and retained in the horizontal position by



a trip lever 27, but, when released from this trip lever, is forced by springs 18 into the vertical position and then forced upwards by a spring 9 and opened by a spring 22. The rod 14 of the parachute 11 is surrounded by a sleeve formed in two parts 16, 16b pivoted together at 17 and acted on by the springs 18. The parachute is normally held with its lower end compressing the spring 9 within a fixed casing 5, by the engagement of a spring catch 19 with a notch 7 in a fixed rod 6. When the trip lever 27 is disengaged from the parachute by means of a rope 29, the parachute is moved into the vertical position, at first by a spring 26, but mainly by the springs 18 acting on the sleeve part 16. As this part closes against the part 16b, a cam-ring 20, connected by a link 21 to the part 16, is pulled upwards and releases the catch 19, whereupon the parachute is forced upwards by the spring 9. Ropes 10, 24 thus become drawn taut and move the keeper 12 downwards, allowing the parachute to open.

- 111,874. Internal-combustion engines. ADAMS, C. I., 24, Beverley Road, Chiswick, and MACHIN, S., 16, Eastcheap, London. Nov. 17th, 1916, No. 16529.

FOUR-STROKE-CYCLE ENGINES; DRIVING-GEAR.—In an engine having radial cylinders which may rotate or remain stationary, the pistons are secured by rods to two levers 2, 9 which rotate intermittently in the same direction as the cylinders, or, in a stationary cylinder engine, in the same direction as a driving cam 4. The arms carry links 34 having rollers 36, working in the cam track 4, and guided in one of a pair of ways 7a, 37 which rotate with the cylinders. During the working and suction strokes, the arms, and the cylinders in a rotating cylinder engine, travel through 180 and 90 degrees respectively. At the ends of the working and suction strokes, the arms remain stationary, the cylinders continuing to rotate whilst the pistons perform their exhaust and compression strokes, which are completed



in approximately one-half the time occupied by the other strokes. The cylinders are arranged in two groups of four each, combustible mixture being supplied separately to each group. By cutting off the mixture supply, one group may be put out of action.

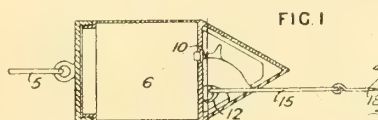
- 111,958. Aeronautics. CHRISTIANSON, C. A., 33, Timber Bush, Leith, Mid Lothian. March 7th, 1917, No. 3331.

FLOATS, ARRANGEMENT OF; LAND WHEELS.—Aeroplanes or other aircraft, for example of the type described in Specification 7686/15, are fitted with two or more floats A, B each provided with two or more pairs of wheels D, the spokes of which take the form of curved blades M serving to propel the machine on water. The wheels of one float may be driven independently of those of the other, either from the engines or manually. The floats may be subdivided by water-tight bulkheads. FIG. 4 shows a modified wheel comprising two rims N, P with blades M between.

CARS.—The floats A, B may carry the passengers, engines, etc.

- 111,981. Aerial warfare. SMITH, R. J., 36, Fitzwilliam Place, Dublin. July 23rd, 1917, No. 10538.

Relates to bombs 6 trailed from aircraft by a line 5 for destroying enemy aircraft, and consists in providing the bomb with a firing device 10 controlled by a trigger 12 which is connected by a short line 15 to grappling hooks 18 adapted to be caught by the enemy aircraft.







ON THE USE OF CHARTS AND TABLES  
IN THE AIRCRAFT INDUSTRY

ON THE RIGGING OF AIRCRAFT. Part 1

**"AIRCRAFT SUPPLIES"**  
OUR FORTNIGHTLY HOUSE JOURNAL

COMPANY'S STOCK LIST—New York  
AGENTS PARTS DEPT. (Continued)

H. T. STEEL  
WIRE  
AGENTS

THE AIRCRAFT

OUR STOCK LIST.  
All items shown  
are IN STOCK for  
immediate delivery  
write and subject

0123  
LITTLE JAMES  
C.

ASCOL  
95 LON

**ASCO**

# AIRCRAFT SUPPLIES

COMPANY LTD.

WIMBORNE  
Dorset

TELEPHONE: WIMBORNE 201

Jan. 3rd, 1938.

KINDLY wire or telephone for any items urgently required, to avoid the possibility of disappointment.

Yours faithfully,  
The Asco Aircraft Supply Co., Ltd.



# THE AIRCRAFT TRADER

## MARKET TOPICS.

(Prices are for quantities on usual terms.)

Feb. 14th, 1918.

**COPPER.**—The Copper Market here is lifeless. Supplies are fairly satisfactory, but it is, of course, impossible to obtain supplies for anything but work of national importance.

The situation in U.S.A. is again giving cause for anxiety. It is not labour troubles this time, but fuel and transport difficulties. There is an acute shortage of the former, and, as is now well known, the railways are terribly congested.

Fortunately, the outputs of the various mines have been at high-water mark recently, and there is not at present any fear of an imminent shortage. Furthermore, recent reports indicate an improvement in both fuel and transport.

Prices, both here and in U.S.A., remain unchanged, although the agitation in America for an increase in price still continues.

### Comparative Prices.

To-day .....	£110
1917 .....	£138
1916 .....	£103

**TIN.**—Supplies of Tin are very uncertain at present, reports having been received of consignments being short. This, of course, has made sellers very backward. On the other hand, the demand from consumers for near Tin has become very lively.

Prices have risen to an unprecedented height. The price at the beginning of January was £269, and the highest price in January was £298 10s., whereas £312 was paid on Monday last, and there does not appear to be any grounds for expecting an improvement in prices.

A list of regulations governing dealings in Tin has been issued by the Ministry of Munitions, and comes into force on the 18th inst.

The only clause which affects consumers is Clause 4, which reads as follows:—

"Consumers may only buy for their own requirements, and may not re-sell without written permission from the Committee (i.e., the Committee of the London Metal Exchange)."

### Comparative Prices.

Feb. 11th .....	£310 0 0 per ton
Feb. 7th .....	£306 0 0 per ton
Last month .....	£294 10 0 per ton
Highest Price, 1917 .....	£300 0 0 per ton
Lowest Price, 1917 .....	£180 15 0 per ton

**LEAD.**—There has been an improvement in supplies, the Authorities are also paying particular attention to scrap lead; on the other hand, the demand continues to increase, and there is no hope of any supplies being available for domestic purposes.

Prices continue unchanged.

**STEEL.**—Steel supplies for Aircraft work are now very satisfactory, although there is shortage of certain sections, particularly hexagons.

There has been a big advance in the prices of High-Speed Steel, which have remained unaltered for two years, the prices fixed in 1916 being 14 per cent. Tungsten, 2s. 10d.; 18 per cent. Tungsten, 3s. 10d. The new prices, which, by the way, came into operation on Feb. 1st, apparently a week to 10 days before official notification of the advance had been received, are for Steel containing 14 per cent. Tungsten, 3s. 8d. per lb. Steel containing 18 per cent. Tungsten, 4s. 5d. per lb.

The advance was inevitable after the recent advances in the prices of ferro-tungsten, tungsten powder, and Swedish iron. It has been asserted that the prices of Cast Steel have become inflated primarily because makers were hardly making any profit whatever out of H.S. Steel. The price of the former is certainly very abnormal. Supplies of Cast Steel are a little easier, H.S. Steel is, however, still difficult to procure.

It would not be surprising to see an advance in the prices of Aircraft Steels.

**TIMBER.**—The question of supplies continues to cause anxiety. Very little Silver Spruce is arriving. There have, however, been fairly good shipments of Spruce substitutes received. Constructors have had very little experience of the latter, and it is expected that there will be a great deal of waste.

We are not yet "out of the wood," and many things might be done even yet to conserve our supplies if only there was co-operation between the Government Departments dealing with Timber and the actual users of the wood.

The whole question of Timber supplies, including Mahogany and 3-Ply-wood, demands the closest investigation, seeing that the country's aeroplane programme for 1918 absolutely depends upon supplies of suitable Timber being available.

Consumers should note that Silver Spruce and substitutes are entirely under Air Board control, and no dealings whatever must be made direct with Timber merchants. Supplies will be allocated to constructors at the controlled price.

**FABRIC.**—It is understood that the question of cotton being used on various parts of machines instead of linen is receiving the attention of the officials concerned. Prices have not yet been revised; at least, no official notification of revision appears to have been issued, although, as stated last week, the suppliers have demanded an advance in price, owing chiefly to the increase in the price of flax.

## THE AEROPLANE SPRUCE SITUATION.

"Aerial Age" (New York) of January 21st, 1918, says that a special committee of the Aero Club of America, which has studied the aeroplane spruce situation, and has found the principal causes which are behind the delay in the production of spruce and are delaying the entire aircraft production programme, has reported that the trouble is mainly an economic one. The lumbermen cannot produce aeroplane spruce at the price set by the Government; and the problem can be solved by adopting in this case, as in other cases, the cost plus 10 per cent. plan.

In the following letter from Mr. Alan R. Hawley, president of the Aero Club, to Mr. Howard E. Coffin, chairman of the Aircraft Board, Mr. Hawley urges the immediate adoption of the cost plus 10 per cent. plan to avoid further delay in the production of the much-needed aeroplane spruce, as follows:

"Dear Mr. Coffin,—(1) We have read with much concern the public statement issued from Portland, Ore., by Colonel Bryce P. Disque, the officer of the Signal Corps of the Army, in charge of the production of the spruce needed for the construction of the military aeroplanes.

"(2) Colonel Disque states that the Army needs 11,000,000 feet of spruce a month, but 'we are only getting 3,000,000 feet a month.' He states, further, that the Government will pay a bonus on all deliveries of spruce prior to February 28, 1918. The prices quoted in the Press dispatches are: '\$90 per thousand feet f.o.b. at point of inspection, plus a bonus of \$40 per thousand feet for all pieces accepted up to January 31, and a bonus of \$30 per thousand feet for all accepted up to February 28.'

"(3) The Spruce Committee of the Aero Club of America, which has kept in touch with the spruce situation throughout these months, and is familiar with its various problems, has reported to the Executive Committee that the delays are mainly due to the fact that the price fixed by the Government for aeroplane spruce is too low and involves the spruce mills in large financial losses. To solve this problem, the Committee urges the Executive Committee to urge the Government to adopt the cost plus 10 per cent. profit plan.

"(4) The report of the Spruce Committee says, in part:

"The U.S. Signal Corps at Portland, Ore., are doing their utmost to increase the output of spruce lumber, but many obstacles have to be overcome which require both time and money before the output comes up to requirements.

"The Western lumbermen say they cannot cut the lumber for the price offered by the Government Spruce Production Bureau, because the quality schedule and standard of inspection have been raised since they agreed to furnish the lumber at a price of \$105 per 1,000 feet, and they can only meet the new schedule at a financial loss. The lumbermen claim that under the old schedule 40 per cent. of the lumber cut from a No. 1 spruce log (the very best logs) would pass inspection. Only 50 per cent. of cutting stock is allowed by the new schedule and the other 50 per cent., or wing beam stock, must be perfect lumber 18 feet long, which is very hard to obtain from even the most perfect logs. Under the old schedule the mill man expected to get 40 per cent., or 400 feet, of aeroplane lumber from each 1,000 feet at \$105 per thousand feet. This lumber would bring \$42, and the balance of



the log cut into box lumber at \$18 per thousand feet brought \$10.80—or a total of \$52.80 per thousand feet. Under the new schedule, passing only 5 per cent., or 50 feet at \$105 equals \$5.25, and 950 feet of box lumber at \$18 equals \$17.10, makes a total of only \$22.35 for the lumber from logs which are worth from \$20 to \$35 per thousand feet in the log market. According to the above figures it is impossible for the mills to produce the lumber without a financial loss. The more they produce the greater is their loss.

"Another economic aspect of the problem is that the large mills are organised for quantity cutting of logs for ordinary purposes, where no time is spent in inspecting logs during cutting, to select the straight grain parts clear of knots. This inspection is necessary to select clear, straight-grained aeroplane spruce, and it slows up the entire organisation and causes a large loss of many hours. This increases the deficit of the lumber mills.

"The adoption of the cost plus 10 per cent. plan will solve this problem, which is purely an economic one.

"There are a great number of mills in the North-west idle at present mainly because it does not pay to operate them for the

production of aeroplane spruce. The cost plus 10 per cent. plan will make it possible to operate them.

"Under this plan the mills will also be able to pay increased salaries to the workmen and get better service and larger production. As the daily cost of the war is so enormous, the additional cost due to increased salaries is of no consequence compared with the value of the time saved in the production of the aeroplane spruce.

"(5) The Spruce Committee's report is rather lengthy and deals with the difficult aspects of the problem, including the transportation of logs. If your Board is interested, we shall be glad to transmit the rest of the report. We touched only on the economic problems in this letter, because this is the one problem which can be solved immediately by the adoption of the cost plus 10 per cent. plan.

"Assuring you again of the hearty co-operation of the Club, I beg to remain,

"Yours very cordially,

"(Signed) ALAN R. HAWLEY, President."

## Commercial Aviation in China: The Possibilities of the Country.

BY ALAN J. DANIELS.

As the question of the possibilities of the aeroplane as a means of commercial transit is creating such an amount of interest at present it might be as well to bring to the notice of enterprising firms and individuals the possibilities, in this direction, of the country of China.

China to a great number of people conveys the idea of a large uncultivated country peopled by millions of half-savages. As a matter of fact, the country in reality is as different as possibly can be from such a state. The land is cultivated on every inch of fertile soil, the people are solid, industrious and far ahead of a great number of so-called civilised countries. The Germans were the first to realise the real from the unreal, and had made huge progress in establishing themselves in the country. The Japanese soon got on the heels of the Germans, but the latter were still far ahead of them at the outbreak of the war.

It is quite true that the British were the first people to establish themselves in any large numbers in China, but so far they have not made enough of the opportunities that are theirs by virtue of their pioneership. The latest bidder for the trade of China is the American, and, without doubt, he is making good progress.

I must apologise for seeming to get away from the primary object of the article, but it is essential that any firm, or individual, who may think seriously of China as a field for present and future commercial aviation enterprise, should know from the start exactly how things stand from an International point of view in this country, which, so far, has only developed a small fraction of its real capabilities. The mineral resources of China are, as yet, practically untouched, but the near future will see a great change.

### NEED FOR COMMUNICATION.

One of the greatest drawbacks to China's progress at the present time is the lack of means of communication. By far the greater portion of China's internal commercial traffic is carried on by water. Railways are only in their infancy: they are slow and very unreliable. On the so-called long-distance journeys there is usually only one train up and one down per day, and it takes one, on an average, three times as long to accomplish a distance as it would do on a European line.

### POSTAL NEEDS.

It is really only quite recently that a postal system has been inaugurated, but the people have been very quick in learning its uses, and have taken up its advantages with enthusiasm, as will be seen from the fact that the receipts for the last financial year exceeded the expenditure by nearly two million dollars. The Chinese have taken very kindly to the "Express" post, and a great amount of mail is carried "Express" now, and the volume is increasing daily.

It is safe to say that the Chinese would welcome any means that would accelerate the mails to the utmost. Of course, as the railways increase in number and efficiency, the mails will be greatly accelerated, but I feel convinced that should a system of mail-carrying by air be introduced, it would take but a very little time to make it a good paying enterprise.

### THE WATERPLANE'S CHANCE.

For the purposes of mail-carrying, the waterplane would be a far more useful machine than the land plane, at least for the next few years, as there are very few places of importance that are not close to some waterway. And it is safe to say that a good-sized waterplane would find little difficulty in rising from or landing on any of the rivers of this country.

One great exception to the above is the great western plain in Szechuan and Hunan, but, at present, this rich field is only very little developed, but in case of necessity large land-going aeroplanes could be used in this district. Naturally, there are other places besides the great plain that would have to be reached by aeroplanes instead of by waterplanes, but such routes

would be only sub-lines for transshipping from the main water routes.

The reason I advocate waterplanes as against land aeroplanes is on account of the lack of landing places for the latter type. I fully realise that vast strides have been made towards perfecting the landing chassis of land aeroplanes since I left for the East, but the difficulty would not be only the nature of the ground, but the fact, as previously stated, that most of the ground is under cultivation, even right up to the very gates of the cities. Naturally, in course of time suitable landing-places would have to be made, but I feel sure that for initial experiments the waterplane is the machine for this country.

### FUEL.

With regard to the fuel supplies, this would present no difficulties whatever, as there are already two large oil companies in China with a network of agencies and sub-agencies over most of the country. These companies are spreading rapidly, and, in a very short while, will embrace the whole of China.

I have spoken with representatives of various importing firms, and in every case have been informed that should any aviation enterprise come to China that would justify them carrying stocks of spares, steel and other metals necessary for the manufacture of spares, there is no doubt that they would do so.

### NATIVE PILOTS.

The Chinese themselves could easily be trained as mechanics, and, if necessary, as pilots. They have proved themselves to be very apt motor-car drivers with little or no nerve. There are hundreds of motors and steam-boats in China run by Chinese engineers entirely, and I feel confident that with special training the Chinese would become expert aeroplane mechanics.

### BUSINESS ADVICE.

Of course, it may be some years before any European nation can turn its attention aeronautically to this country. On the other hand, it may be possible in the near future, and, therefore, no British firm should lose sight of China.

If any firm should decide to investigate the possibilities of China, a great amount of valuable time would be saved if someone conversant with China and the ways of the Chinese was sent out for the investigation. It takes one a considerable time to learn how to deal with the Chinese, and through going the wrong way to work an excellent proposition might be ruined.

### MILITARY AVIATION.

China is taking an interest in aviation from a military point of view, and there are one or two machines and pilots capable of flying, as will be seen from the fact that the Military Governor of the Province of Hunan, who is at the time of writing trying to quell a rebellion in his Province, has asked the Central Government to help him by sending a couple of aeroplanes. Whether they will be sent or not, I cannot say, but the fact remains that the Governor has asked for them.

I have not mentioned passenger traffic, or dealt with any other uses to which the aeroplane can be put in China, as these can be incorporated in any scheme for mail-carrying.

I sincerely hope that this article may induce British firms to investigate the possibilities of this country, and will lead to questions being asked that will keep the matter constantly before them to be taken up after the cessation of hostilities.

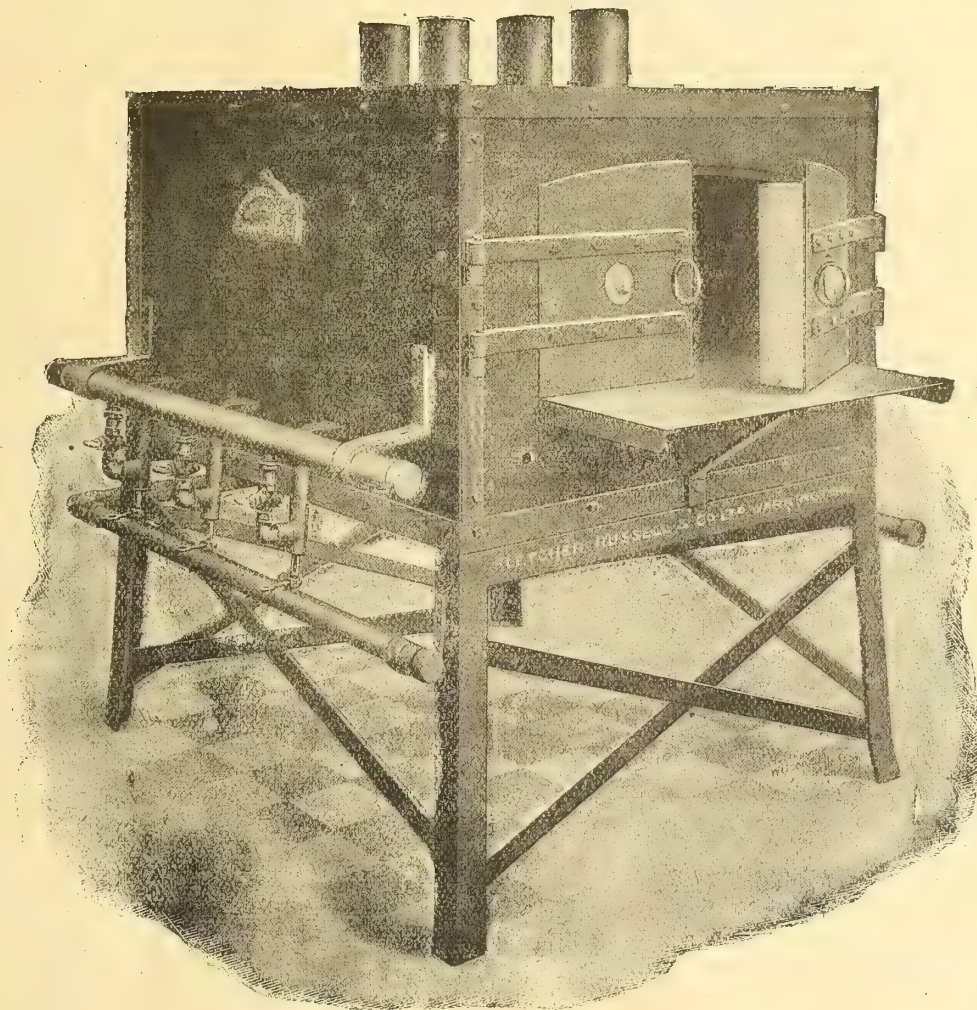
[Mr. Daniels, the author of the foregoing article, has been resident in China for some years, and has studied aviation as closely as possible since he left England. He is, therefore, well acquainted with the possibilities both of aeroplanes and of the Chinese people. He intimates that he will be pleased to answer any questions which anyone interested in the possibilities of flying in China cares to ask him. Letters addressed to him at this office will be forwarded.—Ed.]



# GAS HEATED OVEN FURNACE

TO WORK WITH LOW PRESSURE GAS  
— AND AIR UNDER PRESSURE. —

For **HARDENING,**  
**CARBONISING,**  
**ANNEALING, &c.**



N 4154.

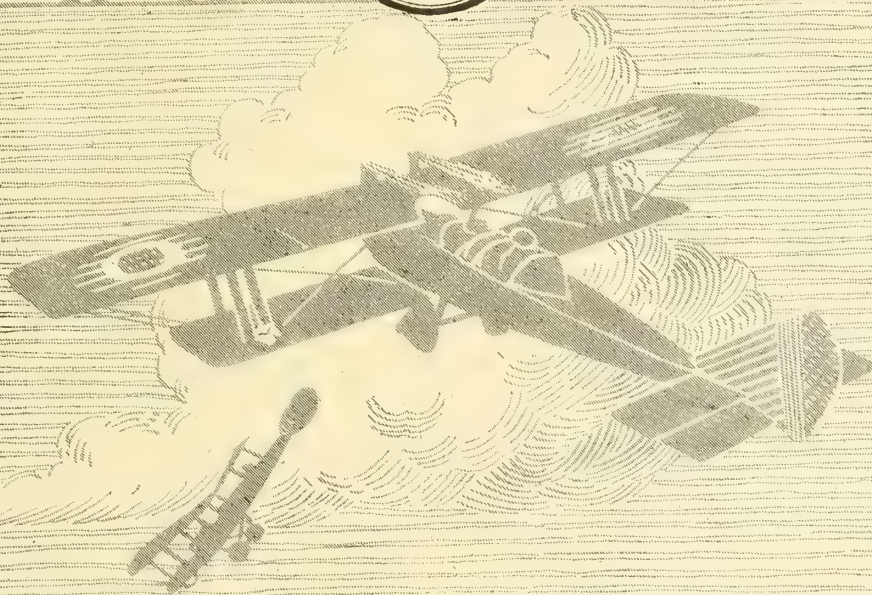
FURNACES OF EVERY DESCRIPTION AND FOR  
— EVERY TRADE REQUIREMENT SUPPLIED. —

**FLETCHER, RUSSELL & Co., Ltd.,**  
PALATINE WORKS,                      ::                      CENTRAL ROAD,  
**WARRINGTON.**







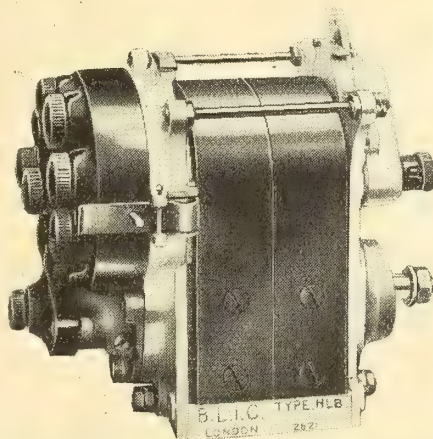


THE HEART OF THE AEROPLANE—  
the vital centre of its power unit—is undoubtedly  
the magneto. Failure there must be unthinkable!  
That is why the "B.L.I.C." Magneto is supreme—  
its absolute reliability may be taken for granted!

# B.L.I.C.

THE BRITISH LIGHTING & IGNITION CO. LTD.

THE BRITISH  
LIGHTING AND  
IGNITION Co., Ltd.

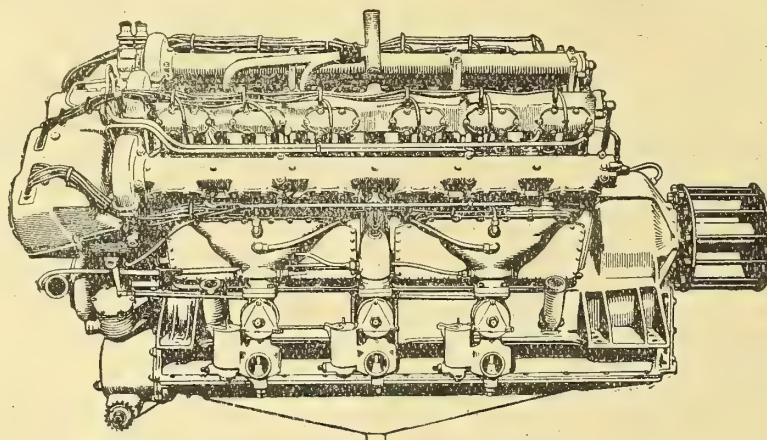


204, Tottenham Court  
Road, London, W. 1.  
Proprietors: VICKERS Ltd.



Original in conception, Sunbeam-Coatalen Aircraft Engines have not only retained their supremacy, but have also added to their prestige by giving service which only the finest engineering practice could make possible.

# SUNBEAM-COATALEN AIRCRAFT MOTORS



18-CYLINDER SUNBEAM-COATALEN AIRCRAFT ENGINE.



**THE SUNBEAM MOTOR CAR CO., LTD.,  
WOLVERHAMPTON.**



# AIRCRAFT FINANCE

## CURRENT TOPICS.

### EXCESS PROFITS DUTY IN PRACTICE.

WARING AND GILLOW, LTD., AND THE ALLIANCE  
AEROPLANE CO., LTD.

The published report of the Fourth Annual Meeting of Shareholders of the well-known firm of Waring and Gillow, Ltd., held on Feb. 12th last, sets out the difficulties under which all engaged in war work production labour in regard to the much vexed question of Excess Profits Duty.

The conditions prevailing in this company, as disclosed in the Chairman's speech, seem to me to describe the ruling state of affairs of the large majority, if not of every company engaged in Government work in the Aircraft Industry. A full report of the Chairman's speech is given below in view of the interesting details, which show the working of this new duty in actual practice, and of its paramount importance to the finance of the Aircraft Industry.

The Chairman said:—This meeting has been postponed for long past the statutory period. When in May last we paid the dividend on the Preference shares it was apparent to the Board that there was no possibility of completing the accounts. It was then hoped that it would be possible to hold the meeting at the latest early in October, and at such meeting to present completed accounts for the year. In this we have been disappointed, and we are not even now in a position to submit accounts.

The difficulty arises mainly from the Finance Acts, 1915-16, imposing the Excess Profits Duty and can be stated quite shortly. We have spent very large sums of money in building and equipping factories. Some of our buildings are of a permanent character; other buildings are of a purely temporary character, while the whole of the machinery and plant was installed purely for war work.

The questions are: How much of this very large expenditure will the taxing authorities allow to be written off out of profits before excess profits are calculated, and over how long a period is the writing off to be spread? When these questions are answered; there is nothing to delay the completion of our accounts, but it is obvious that till definite answers can be given we cannot present final figures.

At the same time the directors are able to state that, as compared with the accounts for the year ended January 31st, 1916—those last published—the business has shown encouraging and continuous progress. A reference to our report for that year will show that our profits, subject to Excess Profits Duty—which we estimate for that year alone at £35,000—was £100,884.

Notwithstanding the Excess Profits Duty it is possible now to state that, notwithstanding the increase in Excess Profits Duty, the directors are satisfied that the profits for the year ended January 31st, 1917, and for the year just concluded will, when the accounts can be finally adjusted, certainly not be less, and this is after making provision at what we believe to be an ample figure for Excess Profits Duty.

We, of course, know our trading figures and can state definitely that they compare most favourably with those last published. It is true that our liabilities are higher—this is due to our greatly increased turnover—but we have no overdue accounts, and our assets are proportionately higher, our book debts being up as the result of money owing by the Government, which is as good as cash; while as compared with cash balance of £86,551 on January 31st, 1916, our cash and investments in National War Bonds stood on January 31st, 1918, at £227,446, and in addition we hold as an investment £51,500 of War Loan.

It is apparent that, with our largely increased turnover, more cash is required in the business, and our War Bonds, as you know, are available towards the liquidation of the Excess Profits Duty when the amount has been ascertained.

### EMERGENCY LEGISLATION.

While, however, the completion of the accounts is bound, for the reasons given, to be delayed, this would in the circumstances be a matter of no real concern were it not for the effect upon the net profits of the Company of the incidence of the Excess Profits Duty, a tax which, while in principle quite just, in its application presses most unfairly upon a company such as ours with, unfortunately, no pre-war standard of profit. Let me give

an illustration as to the way in which war taxation presses unfairly upon us.

When the Excess Profits Duty was first imposed it amounted to 50 per cent. It was then raised to 60 per cent. and is now 80 per cent. We are entitled, before the Excess Profits Duty comes into operation, to the standard rate of percentage only—that is, 6 per cent. upon the capital employed in the business.

Now it is contended by the authorities that, under the Act, the capital employed in the business is not (for the purpose of Excess Profits Duty) the nominal capital of the company, but is less by the whole of the Ordinary shares. These 500,000 Ordinary shares of 10s. each, issued as fully paid, are treated by the taxing authorities as not representing any cash value, with the result that we are not allowed the standard rate of percentage upon this large sum.

### HUSBANDING THE RESOURCES.

It has been suggested by some of our friends that the company ought to pay the arrears of Preference dividend. You know that from the first there were arrears of just over a year. The Board have carefully considered this, and decided, in the interests of the company, that it is not advisable to do so. The directors are of opinion that under present circumstances it is more to the advantage of shareholders to retain the profits beyond the current year's dividend in the business. No one can tell what will be the conditions we shall be called upon to face after the war, and we regard it as of the highest importance that our cash resources should be preserved as far as possible, and that we should strengthen in every legitimate way the position of the company.

Here, again, the incidence of the Excess Profits Duty is very hard upon us. Let me give a further illustration based upon the figures of our last published balance-sheet. If you remember, this contained provision for writing off £20,000 from the underwriting commission. There was also a figure of £2,491 for the amortisation of leases, which we are, of course, bound to provide, and the carry forward, less the amount brought in, was £5,885.

These sums together amount to £28,376, and to enable us to make these absolutely essential provisions necessitates a payment in taxation alone, with Excess Profits Duty at 80 per cent. and income-tax at 5s. in the £, of no less a sum than £160,000. Add to these sums the amount required for one year's Preference dividend and the interest and sinking fund upon the Debentures, and it will be seen that we need to make a total profit of nearly £265,000.

Out of this large sum, not only would there be nothing for the Ordinary shares, but there would be nothing for the year's dividend on the Preference shares in arrear. Put in another way, of every £100,000 we make, after providing for the Preference dividend and interest and sinking fund on Debentures, the Government take £85,000, leaving the company only £15,000.

### "O.H.M.S."

It has, moreover, to be borne in mind, in connection with our war work, that we are not only in competition with other firms, but that whatever the competition may be—and it is often severe—we have to satisfy the authorities that our prices bear but a low percentage of profit, and our experience is that the officials are very zealous and thorough, allowing us, we sometimes think, a lower margin of profit than we feel, in all the circumstances, we are entitled to—profits which, in some instances, very little more than cover overhead charges.

We have, however, notwithstanding all difficulties, succeeded in making a reputation with the authorities for good workmanship and materials, and, what is equally important, keeping our promises in regard to deliveries. This excellent reputation we desire to perpetuate for the benefit of the company in the future, as it is obvious that many of the articles we are now engaged in manufacturing will be required when the war is over.

In this connection I am pleased to be able to refer to a very important development, which the Board believe will form a most desirable and profitable branch of the business in the future. We hope to concentrate in this factory all the special businesses which we have developed as the result of our war enterprises. I cannot pass from this subject without referring to what I believe is common knowledge—namely, that Mr. S. J. Waring is mainly responsible for this valuable development. He created and perfected the organisation, and was, and is, the life and soul of the enterprise, and we look forward with confidence to the continua-



tion and development of our new business after the termination of the war.

After alluding to a private and subsidiary company—the Alliance Aeroplane Company, Ltd.—which has been established by and is entirely under the control of Waring and Gillow for the manufacture of complete aeroplanes, the Chairman continued:—

You will, I think, expect me to say a word or two about our general business. As to this, I am glad to say that—notwithstanding the difficulties consequent upon a depleted staff, in obtaining stock and the reduced facilities for dispatch—every department of the company's business shows a gratifying increase, and the directors desire to take this opportunity of saying that the results reflect the greatest credit upon the staff, who have worked ungrudgingly and grappled successfully with the many difficulties and adverse conditions to which I have alluded.

[In this particular connection it is interesting to note that Mr. J. S. Waring is directly further interested in the Aircraft Industry, as I find his name appearing officially in connection with the Aircraft Trust Co., Ltd., and the British Aerial Transport Co., Ltd.—G. A.]

### COMPANIES' ANNOUNCEMENTS. MORTGAGES AND CHARGES.

CAMBRIDGE SCHOOL OF FLYING AND AERODROME CO., LTD.—Registered Jan. 30th, 1918. £2,500. Debentures (filed under Sec. 93 (3) of the Companies (Consolidation) Act, 1908), present issue £1,825, secured by a general charge.

### WINDING UP.

GLENDOWER MOTOR CO., LTD.—Resolved, Feb. 1st, 1918: "That the Company be wound up." Liquidator: Arthur Sissons, 65, London Wall, E.C.

### COMPANY REPORT.

MANN, EGERTON AND CO.'S REPORT.—The report of Mann, Egerton and Co., Ltd., for the financial year ending Sept. 30th, 1917, shows a net trading profit of £37,956. After covering directors' and auditors' fees, income tax, interest, depreciations of land, buildings, and machinery, the usual dividends on the preference and ordinary shares will be paid. Liberal appropriations are made to reserve account, whilst a substantial amount is carried forward to 1917-8. The free reserves now stand at £28,000, while the item of "goodwill" appears in the accounts at the nominal figure of £5,000.

### NEW COMPANIES.

The files of the following new companies are available for inspection at Somerset House.

MALDEN ENGINEERING AND AIRCRAFT EQUIPMENT CO., LTD.—Private Company. Registered Feb. 8th. Capital £3,000 in £1 shares (2,900 7½ per cent. cumulative pref.). Manufacturers of and dealers in aircraft and motor parts, accessories and equipments, machinery and aeronauts' clothing, electrical and general engineers, etc.

The subscribers (each with one share) are:—

W. Hinds, 9, Castleton Mansions, Barnes, S.W.13, jeweller.

T. H. Hellyar, 2, Byfield Gardens, Barnes, S.W.13, electrical engineer.

The first directors are:—W. Hinds, T. H. Hellyar, and C. Hellyar. W. Hinds is chairman and managing director. Remuneration of managing director £200 per annum; of others as fixed by the company. Registered office: College Works, Malden Road, New Malden, Surrey.

MECHANICS, LTD.—Registered Feb. 5th to carry on the business of mechanical engineers, etc. Nominal capital, £4,000 in 3,900 £1 Ordinary shares and 2,000 1s. Deferred shares.

AIRCRAFT AND PRODUCTION AUXILIARY ASSOCIATION, LTD.—Registered Jan. 5th to carry on all or any of the businesses of contractors, carriers, electricians, etc. Nominal capital. Every member of the association undertakes to contribute to the assets of the association in the event of the same being wound up, the sum not exceeding £2.

INTERNATIONAL AIR TRANSPORT CO., LTD.—Private Company.

Registered Feb. 9th. Capital £2,000 in £1 shares. Carriers of passengers and goods by land, air or sea, manufacturers and hirers of airships, aeroplanes, balloons, hydroplanes, etc.

The subscribers (each with one share) are:—

G. F. Heath, 17, Park Hill, Moseley, Birmingham, motor engineer.

F. H. Pepper, 34, Waterloo Street, Birmingham, solicitor.

The first directors are to be appointed by the subscribers. Registered office: 34, Waterloo Street, Birmingham.

### CLOSING OF TRANSFER BOOKS.

PETER HOOKER, LIMITED.—Notice is hereby given that the share Transfer Books of the Company will be Closed from Feb. 19th to March 5th, 1918, both days inclusive.—By Order of the Board, R. A. W. Charlton, Secretary, Blackhorse Lane, Walthamstow, London, N.E.17.

### ANSWERS TO CORRESPONDENTS.

Enquiries on any subject relating to Investments, Stocks, Shares and Securities of aircraft or kindred companies will be answered in these columns, free of charge.

Letters should be accompanied with the names and address of the writer (solely as evidence of good faith) and the correspondent should adopt a "nom de plume" under which the reply will appear.

"NEMO."—It is of the greatest importance that the Register of Members should be promptly and accurately entered up, as delay or inaccuracy may lead to expensive litigation. The Acts prescribe that if the name of any person is without sufficient cause entered in or omitted, or if default is made or unnecessary delay takes place in making the requisite entry, the member aggrieved, or any member of the company, or the company itself, may apply by motion in any of the Superior Courts for an order that the Register may be rectified at the expense of the defaulting party.

"L. V. P."—In the case of a company limited by shares, if the Memorandum of Association is not accompanied by Articles of Association, or in so far as the Articles filed do not exclude or modify the regulations of "Table A," the said "Table A" shall so far as they are applicable be deemed to be the Articles of the Company.

"J. T. L."—The fact that you are the purchaser of "forfeited shares" may debar you from the right of voting should there be unpaid calls or other sums due to the company in respect of the said shares.

"CHAIRMAN."—As chairman you would be compelled to put to the meeting any amendment (even if contrary to your own views), always providing that it had been properly proposed and seconded, and take the vote of the meeting thereon.

"LOGIC."—A meeting convened by the Secretary without the authority of the Board of Directors cannot pass operative resolutions.

G. A.

### NOTICE.

The Glendower Aircraft Company, Limited (whose business is the making of aeroplanes), notify the public and all other persons whom it may concern, that they are in no way connected with the Glendower Motor Company, Limited, and that their business is entirely separate and distinct in every way from the business carried on by the Glendower Motor Company, Limited.

### A TRADE MOVE.

Mr. W. Brierley, A.F.A.E.S., A.M.I.Mech.E., late of the Technical Department of the Aircraft Manufacturing Co., Ltd., Hendon, has joined the staff of the National Aeroplane Factory at Liverpool as chief draughtsman and designer. It is interesting to learn that designers are engaged at National aeroplane factories, for one has hitherto been under the impression that these factories were to reproduce the designs of others and not to undertake designing on their own accounts.

### CURRENT SHARE QUOTATIONS.

Aircraft Mfg. Co. 7% cum. pref. £1 ... 23- 24- 7% cum. & ptg. "B" ... 22- 23- pref., (fully paid) ... 22- 23- Armstrong (Sir W. G.) Whitworth & Co., Ltd. 4% cum. pref. £5 ... 34 34 5% 2nd. pref. £1 ... 17- 18- Austin Motor Co., Ltd. 7% ordinary ... 43- 44- 7% cum. pref. £1 ... 18- 19- £1 ordinary ... 24- 25- Birmingham Small Arms Co., Ltd. £1 ordinary ... 59- 60- 5% cum. "A" pref. 4 4 6% cum. "B" pref. 20- 21- Boulton & Paul, Ltd. 5% cum. pref. £1 3 4 Brown Bros., Ltd. 6% cum. pref. £5 ... 4 4 Darracq (A) & Co., Ltd. £1 ordinary ... 24- 35- (1905) Ltd. 7% cum. pref. £1 ... 23- 24- Electric Construction Co., Ltd. 7% cum. pref. £1 ... 20- 21- £1 ordinary ... 24- 25- Fellows Magneto Co., 8% cum. partip. pref. ... 16- 17-	General Electric 6% cum. pref. £10 ... 104 104 Co., Ltd. £10 ordinary ... 19 20 Gwynnes, Ltd., 5% cum. pref. ... 5 5 Ordinary ... 41- 42- Greenwood & Batley, Ltd. £10 ordinary ... 9 10 Humber, Ltd., 6% cum. pref. £1 ... 15- 15 6 £1 ordinary ... 22- 22 6 Napier (D) & Son, Ltd., 7½% cum. pf. £1 18- 19- x Peter Hooker, Ltd., £1 7% cum. partip. 1st pref. 19- 20- Rolls Royce, Ltd. £1 ordinary ... 67- 68- Rudge Whitworth, Ltd. £1 ordinary ... 45- 46- Ruston, Proctor & Co., Ltd. £1 ordinary ... 28- 29- & Co., Ltd. 5% cum. pref. £1 ... 16- 17- x Sunbeam Motor Car Co., Ltd. £1 ord. ... 80- 81- Straker Squire, Ltd. (1913), £1 ordinary 21- 22- S. Smith & Son, Ltd. (Motor Accessories) £1 ordinary ... 28- 29 -	Triplex Safety Glass, £1 ordinary ... 24- 25- Vickers, Ltd., 5% pref. stock ... 78 826 5% pref. shares. £1 ... 17/6 18- £1 ordinary ... 44- 45- Wm. Beardmore & Co., Ltd., 6% c. pf. £1 19- 20-
--	---	---

### GENERAL INFORMATION.

Armstrong, Whitworth (1916).  
Austin Motor (1916).  
B'ham Small Arms (1915-16).  
Rolls Royce.  
Rudge Whitworth.  
Straker-Squire (1915).  
Sunbeam Motor.  
Thorncroft (J. I.) & Co.  
Vickers (1915 and 1916).

x—ex dividend



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

[illegible]



**Firth's**  
**"Speedicut" High-Speed Steel**  
**For turning Tools.**

**"Speedicut" Milling Cutters**  
**and Drills**  
**For all workshop purposes.**

**Thos. Firth & Sons Ltd.,**  
**Sheffield.**

# **VICKERS LIMITED.**

**Contractors to the**  
**WAR OFFICE AND ADMIRALTY.**

**Aviation Department, Imperial Court,**  
**Basil Street, Knightsbridge, S.W.3.**

Telephone No.—  
**KENSINGTON 6810 (2 lines).**



Telegraphic Address—  
**VICKERFYTA, KNIGHTS, LONDON.**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



(Continued from page 724.)

**SHOOSMITH—GREENWOOD.**—On Feb. 9th, at Holy Rood Church, Crofton, Hants, Flt. Sub-Lt. William Matthews Shoosmith, R.N.A.S., was married to Dorothy, daughter of Charles Greenwood, late Captain 4th Border Regt., formerly of Beech Grove, Harrogate, by the Rev. R. Leigh.

**BIRTHS.**

**JOYCE.**—On Jan. 28th, at Villa Acacia, Asnières, near Paris, Germaine (*née* Fuchs), wife of Flt. Comdr. S. B. Joyce, R.N., of a daughter.

**MORGAN.**—On Feb. 14th, at The Beeches, Byfleet, the wife of Flt. Comdr. C. W. F. Morgan, R.N., of a son (Phillip Charles Fairfax.)

It is officially announced that the King has been graciously pleased to approve the grant of the Polar Medal in silver, with clasp inscribed "Antarctic 1914-16," to the undermentioned member of the Imperial Trans-Antarctic Expedition, 1914-16:—

**ENDURANCE PARTY.**—Proby. Flt. Officer L. A. Hooke, R.N.

**MILITARY.****G.H.Q. COMMUNIQUÉS.**

**FEB. 12th, 9.17 p.m.**—On the 11th inst. mist, high winds, and low clouds again made weather conditions unfavourable for flying. Little work was possible with the artillery, but our aeroplanes carried out several successful reconnaissances, and dropped over a ton of bombs on various targets behind the enemy's lines. No fighting took place.

To-day, our machines carried out a raid into Germany and bombed the town of Offenburg.

Details of this raid have not yet been received.

**FEB. 13th, 9.46 p.m.**—On the 12th instant weather conditions again rendered flying practically impossible.

Work in conjunction with the artillery was attempted, and a few hostile batteries were engaged. Bombs were also dropped by our aeroplanes on various targets behind the enemy's lines, and machine-gun fire was opened from the air upon his trenches.

In the raid carried out by us yesterday into Germany, over one and a quarter tons of bombs were dropped on the barracks and railway station south of Offenburg with excellent results.

Several direct hits were observed on the railway station and line and on a railway workshop. Several bursts were seen also in the vicinity of the barracks. Two fires were started in the town.

One of our aeroplanes also carried out a successful reconnaissance of hostile aerodromes in Germany.

All our machines returned.

**FEB. 14th, 9 p.m.**—On the 13th inst., little work was possible owing to low clouds and rain. A few reconnaissances were carried out by our aeroplanes in the early morning, and bombs were dropped on various targets.

**FEB. 15th, 9.20 p.m.**—On the 14th inst. low clouds and mist continued, and greatly impeded flying.

In spite of these unfavourable conditions reconnaissances were attempted by our aeroplanes, and a few bombs were dropped behind the enemy's lines. A hostile convoy and troops on the road were attacked with machine-gun fire from a low altitude.

One of our machines is missing.

**FEB. 16th, 9.5 p.m.**—On the 15th inst. the weather was again overcast and misty, but our aeroplanes carried out several reconnaissances. A few bombs were dropped and machine-gun fire was opened on the enemy's trenches and on various other targets behind his lines.

Last night our machines dropped bombs on Menin railway station and sidings, and on hostile aerodromes and billets.

One German machine landed intact behind our lines, and its occupants were taken prisoner.

All our machines returned.

**FEB. 17th, 9.35 p.m.**—On the 16th inst. the weather was very fine and visibility good.

Our aeroplanes carried out observation for the artillery all day and took photographs of the enemy's rear lines and aerodromes. Hostile billets, railway stations, and troops were bombed and engaged with machine-gun fire throughout the day.

A large calibre German gun was also bombed, and in the course of the day over 5½ tons of bombs were dropped by us on different targets.

Fighting machines on both sides were most active, and frequent attacks were made by the enemy on our bombing, photographic, and artillery machines. In air fighting 14 German machines were brought down, and seven others were driven down out of control. Our anti-aircraft guns shot down two other hostile machines, one of them being a large bombing machine, which carried four men. This latter machine fell in our lines and its four occupants were taken prisoners. Another German aeroplane, making the 17th accounted for during the day, in addition to those driven down out of control, landed near one of our aerodromes, and its occupants were also taken prisoners.

Five of our aeroplanes are missing.

During the night of the 16th-17th inst. our machines dropped 400 bombs on hostile aerodromes in the neighbourhood of Ghent, Tournai, and Laon. The railway station and sidings at Conflans—15 miles west of Metz—were also successfully bombed from a low height, bursts being observed in the sidings.

All our machines returned.

**FEB. 18th, 9.57 p.m.**—The weather was again fine on the 17th instant, and enabled our aeroplanes to proceed with their work in conjunction with the artillery and to take photographs of the enemy's aerodromes and back areas.

Bombing, which had been carried on incessantly throughout the previous 36 hours, was continued, and over six tons of bombs were dropped by us on various targets, including hostile aerodromes in the neighbourhood of Tournai and Lille, a large ammunition dump near Courtrai, and numerous billets.

Fighting in the air was again most severe, the enemy's scouts making determined but unsuccessful attacks against our bombing machines.

Ten hostile aeroplanes were brought down and six others were driven down out of control.

Three of our machines are missing.

On the night of the 17th-18th instant, further bombing raids were carried out against hostile aerodromes south of Ghent and west of Tournai as well as against many of the enemy's billets.

Another most successful raid was carried out on the railway station and sidings at Conflans (west of Metz). A ton of bombs was dropped, and bursts were observed on sheds at the edge of the sidings, where a large fire was started. Other bursts were clearly seen on the siding and near the railway station.

In spite of the exceptionally heavy fire of the enemy's anti-aircraft guns, all our machines returned.

On the 18th inst. our bombing squadrons raided the barracks and railway station at Trèves, on the Moselle, and the steel works and railway station at Thionville.

The raid was carried out in broad daylight, and excellent results were obtained.

At Trèves bombs were seen to burst in the gasworks, near the barracks, and also in the town, where two large fires were burning when our aviators left.

At Thionville direct hits were obtained on the railway.

Anti-aircraft gunfire was again considerable and accurate, but all our machines returned safely.

**WAR OFFICE COMMUNIQUÉS.**

**FEB. 13th.**—The G.O.C. British Forces in Palestine reports:—

Since the issue of the last communiqué on Feb. 7th active operations have mainly been restricted to the Air Service. On Feb. 12th a successful bombing raid was carried out by Australian flying units on the railway station at El Kutrani (on the Hedjaz railway, 80 miles north of Maan); 1,040 lbs. of bombs were dropped, and 14 direct hits obtained on the station buildings, track, locomotives, and rolling-stock. All our machines returned safely.

In the course of patrolling operations one of our aeroplanes was attacked by an enemy formation composed of five scouts and two larger machines. Two out of the five scouts were driven down, whereupon the remaining three broke off the combat. Our aviator then pursued the large enemy machines and drove both of them down in the vicinity of Tul Keram (23 miles north-east of Joppa).

**FEB. 13th.**—The G.O.C. British Forces in Macedonia reports:—  
An enemy aeroplane was shot down in an air fight near Topoljani (east of Seres).

**HOME COMMAND COMMUNIQUÉS.**

**FEB. 16th, 12 midnight.**—Hostile aircraft crossed the Kent coast of the Thames Estuary shortly before 10 this evening and proceeded towards London. The raid is still in progress.

So far only one bomb is reported as having been dropped in London.

**FEB. 17th, 10.45 a.m.**—About half-a-dozen enemy aeroplanes made the mouth of the Thames about 9.45 last night and carried out an attack against London.

All were turned back save one machine, which penetrated into the capital along the line of the river and dropped a single bomb in the South-West district about 10 p.m. This bomb demolished a house and buried an invalided officer, his wife, and two children.

Several other bombs were dropped by the raider in the eastern outskirts on its way in, but no serious casualties or damage are reported.

An attack which was delivered against Dover about 10.45 p.m. was driven off, some bombs being dropped in open country.

Several of our pilots engaged the enemy. One of them fought an action over the Kent coast, and shortly afterwards a large enemy machine was seen from the shore to crash into the sea.

Police reports of casualties and damage have not yet been received, but are apparently light.

**FEB. 17th, 11.40.**—Hostile aeroplanes came in over the Thames Estuary shortly after 10 p.m. and proceeded towards London.

Some bombs have been dropped in the capital.

The raid is still in progress.



FEB. 18th, 11 a.m.—Last night's raid appears to have been carried out by six or seven enemy aeroplanes, of which only one penetrated into London.

The first raider passed the Isle of Thanet about 9.45 p.m., and proceeded up the Thames Estuary into London, crossing the capital from south-east to north-west. Bombs were dropped in various districts between 10.40 and 10.55 p.m.

The remaining raiders, which attempted to reach London from the north-east across Essex, or from east along the line of the River Thames, were all turned back.

The casualties caused by last night's aeroplane raid were:—

KILLED.—13 men, 3 women—total, 16.

INJURED.—27 men, 10 women—total, 37.

The total casualties caused by the aeroplane raid on Saturday night were:—

KILLED.—3 men, 5 women, 3 children—total, 11

INJURED.—1 man, 3 children—total, 4.

12 p.m.—Hostile aircraft crossed the coast of Essex shortly after 9 o'clock to-night, and proceeded towards London.

None of the raiders penetrated the defences, and so far no damage or casualties have been reported.

#### THE CASUALTY LIST.

Reported Feb. 13th.

KILLED.—Caldwell, Lt. J. H., Cam'n. Highrs., attd. R.F.C.

Giovanetti, Sec. Lt. A. H., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—

Ainger, Lt. H. C., R. Scots, attd. R.F.C.

Bishop, Sec. Lt. W. R., R.F.C.

McKenna, Lt. J. M., R.F.C.

Marshall, Lt. B. S., M.C., R.F.C.

Sutcliffe, Sec. Lt. S., R. Welsh Fus., attd. R.F.C.

DIED.—Perry, Lt. C. H., R. Fus., attd. R.F.C.

WOUNDED.—Harwood, Lt. G., Suff. R., attd. R.F.C.

Shanks, Lt. D., R.F.C.

MISSING.—Pakenham-Walsh, Lt. L. H., Ches. R., attd. R.F.C.

Powell, Maj. F. J., M.C., R.F.C.

PREVIOUSLY REPORTED PRISONERS, NOW REPORTED WOUNDED AND

PRISONERS IN GERMAN HANDS.—Brown, Sec. Lt. C. H., R.F.C.

Miller, Sec. Lt. D., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN

GERMAN HANDS. Castle, Sec. Lt. A. F., R.F.C.

Clark, Sec. Lt. A. L., R.F.C.

Turner, Sec. Lt. G. F., R.F.C.

INTERRED IN HOLLAND.—Biheller, Lt. W., M.C., R.F.C.

Reported Feb. 14th.

WOUNDED.—Lipsett, Sec. Lt. G. A., R.F.C.

Millett, Sec. Lt. C. B., R.F.C.

Russell, Sec. Lt. G., R.F.C.

Turnbull, Sec. Lt. J. O. M., R.F.C.

PREVIOUSLY REPORTED PRISONERS, NOW REPORTED WOUNDED AND

PRISONERS IN GERMAN HANDS.—Hammersley, Sec. Lt. F. J.

B., Midd'x R., attd. R.F.C.

Stewart, Sec. Lt. R. J. G., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN

GERMAN HANDS.—Davies, Sec. Lt. H. E., R.F.C.

Leggatt, Sec. Lt. C. W., R.F.C.

Reported Feb. 15th.

KILLED.—Beamer, Sec. Lt. A. M., R.F.C.

Kearley, Sec. Lt. H., Lond. R., attd. R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—

Hall, Sec. Lt. G. W., R.F.C.

Hearn, Sec. Lt. E. T. H., R.F.C.

Keast, Sec. Lt. W. R., R.F.C.

Sillem, Sec. Lt. S. C., R.F.C.

DIED OF WOUNDS.—Miller, Sec. Lt. F. D., R.F.C.

WOUNDED.—Barker, Sec. Lt. F., R.F.C.

Boysen, Sec. Lt. H. K., R.F.C.

MISSING.—Gaisford, Lt. R. S., R.F.A., attd. R.F.C.

Green, Lt. E. G., M.C., R.E., attd. R.F.C.

Martin, Sec. Lt. P. C. C., Sher. For., attd. R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN

AUSTRIAN HANDS.—Barnes, Lt. J. D., Durh. L.I., attd.

R.F.C.

Goldie, Lt. G. N., R.F.C.

Reported Feb. 16th.

KILLED.—Lewis, Sec. Lt. F. A., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—

Clement, Capt. C. M., R.F.C.

Graham, Lt. R. L., R.F.C.

Halliwell, Sec. Lt. E. J., R.F.A., attd. R.F.C.

Jardine, Sec. Lt. R. G., R.F.C.

McCullough, Sec. Lt. F. J., R.G.A., attd. R.F.C.

Warter, Sec. Lt. F. G., Wilts R., attd. R.F.C.

WOUNDED.—Kelley, Lt. W. H., S. Lan. R., attd. R.F.C.

Medcalf, Capt. J. H., R.F.C.

MISSING.—Ball, Sec. Lt. A. C., Sher. For., attd. R.F.C.

Cudmore, Sec. Lt. E. O., R.F.C.

Holmes, Sec. Lt. A., R.F.C.

Lytton, Sec. Lt. P. A. B., R. Ir. Regt., attd. R.F.C.

Pohlmann, Sec. Lt. R. P., R.F.C.

PREVIOUSLY REPORTED PRISONER, NOW REPORTED WOUNDED AND PRISONER IN GERMAN HANDS.—Kingsland Sec. Lt. W. R. R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN GERMAN HANDS.—Biddington, Sec. Lt. H. V., R.F.C.

Boyd, Lt. J., Sco. Rif., attd. R.F.C.

Pope, Capt. E. E. E., R.F.C.

Young, Sec. Lt. J. H., Lond. R., attd. R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN BULGARIAN HANDS.—Rowan, Lt. A., K.R.R.C., attd. R.F.C.

Tracey, Sec. Lt. H. A., S. Wales Bord., attd. R.F.C.

PREVIOUSLY REPORTED WOUNDED, NOW REPORTED NOT WOUNDED.—Whitehead, Sec. Lt. T. R., R.F.C.

CANADIAN FORCES.—ACCIDENTALLY KILLED.—Ellis, Lt. D. Q., Can. Rly. Troops, attd. R.F.C.

Reported Feb. 18th.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Field, Lt. N., Manch. R., attd. R.F.C.

MISSING.—Alderson, Sec. Lt. A. G. D., Worc. R., attd. R.F.C.

Kent, Sec. Lt. P. F., R.F.C.

Moore, Lt. L. W. B., R.F.A., attd. R.F.C.

CORRECTION.—KILLED.—Perry, M2/033247 Cpl. W. C., A.S.C., attd. R.F.C., should read Perry, Sec. Lt. W. C., R.F.C.

Reported Feb. 19th.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—De Lacey, Sec. Lt. J. M., W. Yorks R., attd. R.F.C.

#### CASUALTIES AMONG N.C.O.s. AND MEN.

THE DATES ARE THOSE OF THE OFFICIAL LIST.

##### KILLED.

FEB. 8th.—R.F.C.—Richards 31142 1st Cl. Air Mech. W. (Falmouth).

##### ACCIDENTALLY KILLED.

FEB. 5th.—R.F.C.—Solomon 54863 2nd Cl. Air Mech. J. (London, E.); Wirths 4000 1st Cl. Air Mech. A. W. (Chilworth).

##### DIED.

FEB. 9th.—R.F.C.—Blacklock 49852 2nd Cl. Air Mech. R. W. (Gateshead); Carter 61115 3rd Cl. Air Mech. P. G. (Portsmouth).

##### DROWNED.

FEB. 9th.—R.F.C.—Achurich 7281 Cpl. W. (Hinckley); Attenborough 33702 Air Mech. F. (Eastbourne); Brooks 60563 Air Mech. E. (Burslem); Clarke 49279 Air Mech. T. H. (Stoke Newington, N.); Dale 92905 Air Mech. F. (Old Trafford); Dobson 63665 2nd Cl. Air Mech. H. (Bradford); Dudman 82859 Air Mech. R. F. (Acton, W.); Gough 98166 Air Mech. S. (Sutton-in-Ashfield); Greaves 92907 Air Mech. W. W. (Bradford); Jackson 92705 Air Mech. E. W. (Caldmore); Laurens 48764 2nd Cl. Air Mech. J. (Plymouth); Lee 35213 3rd Cl. Air Mech. C. (Cambridge); Lucas 51842 2nd Cl. Air Mech. H. (Enfield Wash); Crimmon 67660 2nd Cl. Air Mech. J. (Bonhill); McGuinness 93463 3rd Cl. Air Mech. E. (Siddal); Martin 91432 Air Mech. G. L. (Glasgow); Pilkington 83823 Air Mech. S. (Gorton); Rees 85235 Air Mech. T. (Porth); Ridgwell 92283 Air Mech. W. E. (Romford); Sidebottom 92711 Air Mech. T. (Oldham); Toms 91451 Air Mech. R. B. (Hounslow); Waller 105028 Air Mech. F. J. (Walworth, S.E.); Wiley 92913 Air Mech. H. C. (Birmingham); Williams 91382 Air Mech. R. J. (Bethel).

##### WOUNDED.

FEB. 5th.—R.F.C.—Leyland 94425 2nd Cl. Air Mech. S. L. (Wallasey).

FEB. 8th.—French 13509 2nd Cl. Air Mech. D. (Camberwell, S.E.); Poulton 24294 1st Cl. Air Mech. S. F. (Reading).

FEB. 9th.—Mann 405239 W. H. (Glasgow).

##### MISSING, BELIEVED DROWNED.

FEB. 9th.—R.F.C.—Armstrong 104189 2nd Cl. Air Mech. J. (Dunscore); Bird 67796 3rd Cl. Air Mech. B. (Glasgow); Bradley 94421 2nd Cl. Air Mech. B. (Chesterfield); Brown 92780 3rd Cl. Air Mech. R. (Brynteg); Butterworth 75931 2nd Cl. Air Mech. L. (Rochdale); Cartwright 92700 3rd Cl. Air Mech. W. (Wrexham); Daffern 93460 3rd Cl. Air Mech. G. W. (Matlock Bridge); Deller 92781 3rd Cl. Air Mech. C. (Wandsworth, S.W.); Driver 92241 2nd Cl. Air Mech. J. C. (Coventry); Dunton 58337 3rd Cl. Air Mech. W. (Golder's Green, N.W.); Hunt 90142 2nd Cl. Air Mech. J. A. (Lambeth Palace, S.E.); Humphreys 85071 2nd Cl. Air Mech. J. (Deptford, S.E.); Jackson 93221 3rd Cl. Air Mech. T. H. (Gomersall); Kendall 94023 2nd Cl. Air Mech. F. (Mutholmroyd); Knight 10398 1st Cl. Air Mech. W. (Camberwell, S.E.); Lane 92885 3rd Cl. Air Mech. J. (Holloway, N.); Morris 40997 2nd Cl. Air Mech. E. T. (Basingstoke); Richardson 27617 Cpl. F. J. (Tunbridge Wells); Ricketts 93464 3rd Cl. Air Mech. C. (Ash Vale); Rae 405720 2nd Cl. Air Mech. J. (Inverness); Turner 91813 3rd Cl. Air Mech. F. J. (Burton-on-Trent); Witchlow 81830 2nd Cl. Air Mech. J. W. (Chelsea, S.W.); Wolfe 93057 3rd Cl. Air Mech. B.





# ARMSTRONG, WHITWORTH

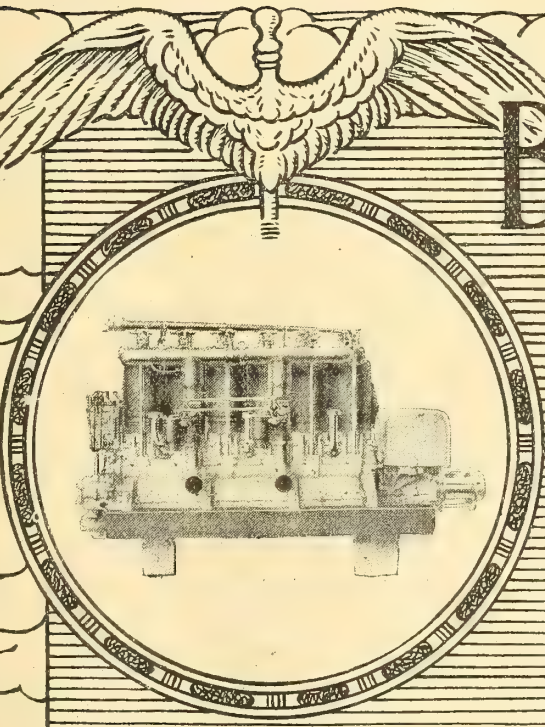
## AIRCRAFT WORKS.

### NEWCASTLE ~ UPON ~ TYNE.



TELEPHONE :- 500 GOSFORTH.

TELEGRAMS :- ARMSTRONG AVIATION,  
NEWCASTLE ~ ON ~ TYNE.



# BEARDMORE

# AERO

# ENGINE

The Name which guarantees  
**EFFICIENCY** and  
advanced design.

The BEARDMORE AERO ENGINE Ltd.  
London Showrooms and Depots :  
112, GT. PORTLAND STREET, LONDON, W.1.  
Telephone : Gerrard 238.

C.D.C.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



H. (Lewisham, S.E.); Wyse 93334 3rd Cl. Mech. R. W. (Selkirk).

# PERSONAL NOTICES.

## DEATHS.

**BULMER.**—Lt. Geoffrey Bulmer, R.F.C., of Long Meadow, Hereford, was found shot on Feb. 15th in a room at the St. Ives Hotel, Paddington, and died in hospital.

**CASTLE.**—Capt. Vernon Castle, R.F.C., has been killed in a flying accident at Fort Worth, Texas, U.S.A. Capt. Castle was an instructor in an American Cadet aviation camp near here. His machine was 50 ft. above the ground and was moving rapidly, when another machine started to rise. Capt. Castle saw the danger of a collision and undertook a difficult turn. The aeroplane failed to respond and crashed to the ground, the pilot being killed instantly. The cadet in the other machine was injured.

Capt. Castle, who was a professional dancer of the tango, was sent to Canada to train aviators, and there, some six months ago, had an accident. Later he was lent to the American Army as a training officer.

**CLARK.**—Sec. Lt. David Goodlet Clark, A.F.C., who was killed in action, was the eldest son of Mr. David Barclay Mellis Clark, of Killara, Sydney, New South Wales, and the grandson of the late David Clark, of Linnkeith, Blairgowrie, Perthshire. He received his commission in the Australian Flying Corps on Oct. 10th, 1917. On Nov. 22nd he was reported missing, and it is now officially reported that he was killed in action on that date. He was 26 years of age.

**CLEMENT.**—Capt. C. M. Clement, R.F.C., who was previously reported missing, is now reported killed. He had seen considerable service, and received his commission as flight commander on Dec. 26th, 1916, and was gazetted to his Army rank of captain on the same date.

**DUSGATE.**—Sec. Lt. Richard Edmund Dugate, R.F.C., was officially reported "missing" on Nov. 30th, 1917, and later reported wounded and prisoner of war in German hands. News received from a brother officer in the same hospital in Germany states that he died on Dec. 19th, 1917, after having his right foot amputated, which resulted in blood poisoning. He was the eldest son of Mr. and Mrs. Dugate, of Tring Hall, Norfolk, and was 20 years of age.

**GASKAIN.**—Lt. Cecil Stanley Gaskain, R.F.A., attd. R.F.C., who was previously reported missing on May 7th, 1917, and is now presumed to have been killed on that date, was the fourth son of D. H. Gaskain, of 45, Borough High Street, and The Grange, Grove Park, Kent.

**GOULD.**—Lt. Leslie H. Gould, Canadians, attd. R.F.C., who was previously reported missing on Oct. 15th, 1917, is now reported by the German air service through the Red Cross of Geneva as having been killed in aerial action on that date while flying over the German lines. Mr. Gould was the only son of Mr. and Mrs. H. Gould, of Winnipeg, and husband of Lillian E. Gould (née Heilbrun), 6, Portland Road, N.4.

**MILLER.**—Sec. Lt. Frederick David Miller, R.F.C., came to England last April from India, where he was employed in the Irrigation Department, P.W.D., United Provinces, as a temporary engineer. He resigned his appointment to join the R.F.C., and went out to the front at the end of last December. He was mortally wounded in action over the German lines on the morning of Feb. 4th. His pilot was also wounded, but with great skill and pluck landed safely at one of our aerodromes. Both were taken to the nearest hospital, where Mr. Miller died about four hours afterwards. As the result of his latest engagement eight out of 12 enemy machines were brought down by his patrol of 10, and the only casualties were in his own machine. He was the second son of Mr. H. Miller, late of the Military Works Services, India, and he was 32 years of age.

**PITT.**—Lt. "Jack" Pitt, R.F.C., who died on Feb. 7th of injuries sustained in a flying accident in England, was the youngest son of Mr. and Mrs. Wm. Pitt, of Mottram-in-Longden-dale, Cheshire, and nephew of Mr. Tom Pitt, of the Lyric Theatre, London. He was 19 years of age.

**ROWAN.**—Flt. Serjt. Lester W. Rowan, R.F.C., of 63, Abingdon Road, Kensington, was killed while flying in England on Feb. 4th. Flt. Serjt. Rowan, who was 27 years of age, had seen service in France, and had been wounded twice, once in 1915, and again in 1916.

**SIMONS.**—Cadet Vazie Simons, M.M., R.F.C., who died on Jan. 25th from injuries received in an aeroplane accident in Egypt, was the elder son of the late Vazie Simons, Esq., solicitor, Pontypridd, and Mrs. Simons, 30, Essendine Road, Maida Vale, W. He was 25 years of age.

**SMITH.**—Sec. Lt. William Reginald Stinston Smith, R.F.C., was the only son of the late T. B. Smith and Mrs. Smith, of 19, Dene's Mansions. He was educated at Lindley Lodge and at Shrewsbury School, entering Mr. Oldham's house in September, 1912. Before he left in December, 1916, he was a school monitor, a member of the cricket XI., and a senior "whip." In January 1917, he joined the R.F.C., gaining his wings in August. In September he was posted to a squadron, and left for France in

October. After being there only a fortnight his machine was brought down, and he was reported missing on Oct. 22nd. News has now been officially received that he died of wounds in Germany, aged 19. His O.C. writes that he was a most able pilot and very popular with the squadron. Besides being an excellent cricketer, Mr. Smith was a fine golfer, being a regular player with the A.D.V. Golf Club.

## ENGAGEMENT.

**GRANT—ST. JOHN.**—The engagement is announced of Capt. T. Grant, M.C., R.F.C., and Miss Lily St. John. Miss St. John is now playing in "Yes, Uncle!" at the Prince of Wales' Theatre.

## MARRIAGES.

**BABINGTON—DANIELL.**—On the Feb. 12th, at Brompton Parish Church, Maj. Philip Babington, M.C., R.F.C., fourth son of Charles Babington, of Croan, Wadebridge, was married to Joan, third daughter of Henry Averell Daniell, of The Ledgers, Cheltenham, by the Rev. Prebendary Gough, assisted by the Rev. L. Standish Ensell, Chaplain to the Forces.

**BIRLEY—KNIGHT.**—On Feb. 11th, at St. Saviour's, Southwark, Capt. George Hornby Birley, R.F.C., younger son of the late Francis Hornby Birley and of Mrs. Birley, was married to Mary, only daughter of Richard William Knight, of Buckminster, Leicestershire, by the Right Rev. the Lord Bishop of Southwark, assisted by the Rev. P. T. Browning.

**CHAMIER—LORDLY.**—The marriage between Lt.-Col. J. A. Chamier, D.S.O., Indian Infantry and R.F.C., and Miss Edwina Ratcliffe Lordly took place at St. Cuthbert's Church, Philbeach Gardens, Earl's Court, on Wednesday, Feb. 20th.

**LOWETH—MITCHELMORE.**—On Feb. 2nd, 1918, at St. Saviour's Church, Ealing, Cecil Banks Loweth, Lt., R.F.C., was married to Marguerite Daisy Mitchelmore, eldest daughter of Mr. and Mrs. Mitchelmore, Woodfield Road, Ealing, by the Rev. A. C. Bucknell, vicar of the parish, and the Rev. W. Evans, friend of the bridegroom.

**MILLER—DAMS.**—On Feb. 2nd, at St. Mary's Church, Farnborough, Capt. Francis Justin Miller, R.F.C., son of Mr. and Mrs. Albert P. Miller, of Stone, Staffs., was married to Dorothy Margaret, second daughter of the Rev. and Mrs. A. E. Dams, The Vicarage, Goring-on-Thames, by the Rev. T. J. Giltinan.

**SHORT—VALENTINE.**—On Feb. 14th, at St. Mark's Church, Farnborough, Capt. F. A. Short, R.F.C., was married to Marion Christabel, daughter of the late Charles Valentine, of Oxford, by the Rev. C. J. Lodge.

## BIRTHS.

**BOYLE.**—On the 15th inst., at 22, Mallord Street, Chelsea, the Honble. Mrs. Alan Boyle, of a daughter.

**FERGUSON.**—On Feb. 12th, at a nursing home in Hampstead, the wife of Harold McLeod Ferguson, Lt., R.F.C. and R.F.A., of a daughter.

**KERRIDGE.**—On Feb. 10th, at Bristol, Grace (née Starkey), the wife of Capt. L. R. Kerridge, R.F.C., of a son.

**MARSHALL.**—On Feb. 11th, at "Holmer," Weston-super-Mare, the widow (née Orr-Ewing), of Sec. Lt. H. W. H. Marshall, R.F.C., of a daughter.

The Royal Humane Society awarded its medal on Feb. 14th, to Lt. John S. Hodges, Royal Fusiliers, attd. R.F.C., for his gallant attempt to save Lt. Fedden, whose machine came down in the sea 800 yards from shore on Jan. 7th.

Mr. Hodges flew out and dropped into the sea, where he supported Mr. Fedden for 35 minutes, when a boat reached them; but when landed Mr. Fedden was dead.

The Society also awarded a medal to Capt. Stanley Hooper, R.F.C., for the rescue of Serjt. Powell from the sea off Folkestone on Feb. 26th, 1917.

\* \* \*

If any relatives of prisoners of war will kindly ask for news of Capt. Ronald T. Townsend, who has been missing since Nov. 30th, 1917, the same will be gratefully received by Mrs. Ronald Townsend, of 3, Grosvenor Crescent, Glasgow.

\* \* \*

News has been received from Switzerland by the father of Lt. Arthur Cyril Ball, Sherwood Foresters and R.F.C., that his son is a prisoner of war, and is uninjured.

\* \* \*

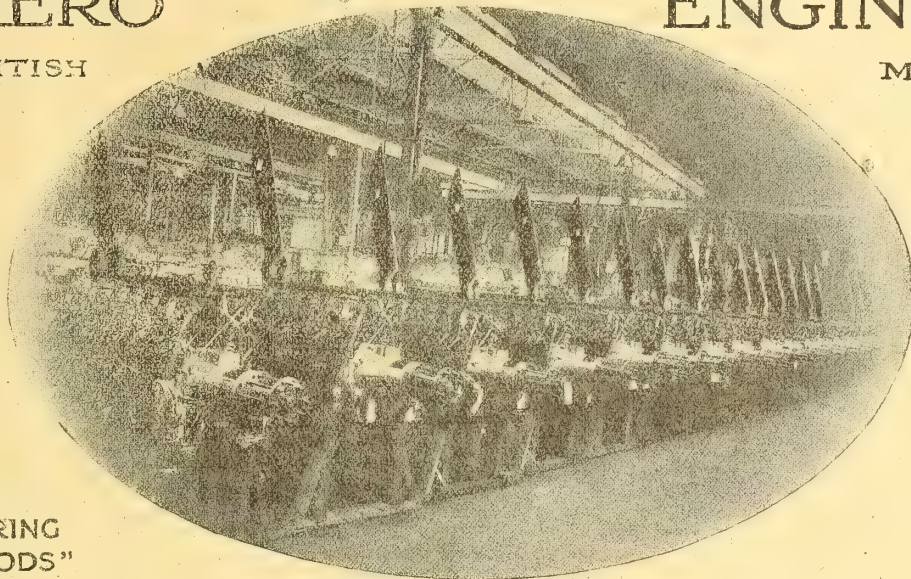
Mr. Philip Gibbs, writing from France on Feb. 8th, in the "Daily Chronicle," of the impending offensive, says:—

Each side has been trying to discover the secret of the other—the plans to which every bit of work along the line may give a clue. Each side has been trying to blind the other's eyes and prevent observation of activity. The German gunners have a "hate" against our balloons, and try to shoot them down by long-range guns, because in the baskets below them are two pairs of watchful eyes noting the activity of their trains behind the lines, and any movement on the roads.

They hate still more our aviators who every day for many days



## MADE



14 NEW BURLINGTON ST  
LONDON W.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



past have been flying over the enemy's lines, spotting their new battle positions, photographing their new saps, and assembly trenches, and ammunition dumps, and attacking the enemy's air squadrons whenever they come out to beat back these observers.

They cannot prevent this work of reconnaissance, and there have been scores of encounters in the air lately in which many hostile machines have been crashed to earth and brought down in flames. The enemy has been desperately anxious to find out our intentions and strength at certain points of the line, and has attempted many raids to get prisoners and information.

\* \* \*

The special correspondent of the "Daily Chronicle," Mr. Philip Gibbs, writing from the British front on Feb. 17th, says:—

Owing to a hard frost and a bright sun and a keen east wind which has blown the mists away, visibility has been good for the past two days, and the airmen on both sides have been fighting for reconnaissance, and the gunners—ours and the enemy's—have been firing more heavily than for several weeks past on various sectors of the front by direct or aeroplane observation.

\* \* \*

The War Office announces that the following officers, who were prisoners of war in Germany, have arrived in Holland for internment:—

Boger, Capt. R. A., R.E., attd. R.F.C.

Grey, Capt. R., G. Gds., attd. R.F.C.

Lindop, Capt. V. S. E., Leins. R., attd. R.F.C.

\* \* \*

A Reuter's message of Feb. 16th states that the intimation of the British Government warning Germany of reprisals in the event of the two British aviators, Capt. Scholz, R.F.C., and Lt. Wookey, R.F.C., being made to undergo the sentence of penal imprisonment passed upon them for dropping leaflets in the German lines, was made to the German Government on the 12th inst. It was handed in on that date by the Dutch Minister in Berlin.

No answer has yet been received. If reprisals become necessary they will, according to The Hague arrangements, commence on March 12th.

\* \* \*

The correspondent of the "Daily Chronicle," writing from the British front in France on Feb. 15th, of the German preparations for the expected spring offensive, says:—

Our airmen are said to be seeing set piece rehearsals by bodies of troops a long way behind the enemy front, but as their own flying men can at almost any time witness similar scenes in our own back areas, it does not follow that specific conclusions can be drawn from this training activity.

#### IRELAND.

On Feb. 16th six cyclists rode to an aerodrome which is being constructed in County Dublin, entered a hut where there were two night watchmen and threatened them with revolvers while the place was being searched. The men, who wore handkerchiefs over their faces, carried away several maps, a theodolite, and a number of papers.

#### FRANCE.

##### OFFICIAL COMMUNIQUÉS.

FEB. 12th.—During the day of the 11th, four German aeroplanes were brought down by our pilots, and in addition, our chaser planes carried out different bombardments. About nine tons of bombs were dropped on the establishments, dumps, railway stations, and cantonments of the enemy, especially on the railway station of Metz-Sablons, where a fire broke out.

FEB. 13th.—Enemy aeroplanes last night dropped several bombs on Nancy. Three persons of the civilian population were killed and five were injured.

ARMY OF THE ORIENT.—Allied aviators have successfully bombarded Saviak (north-west of Seres), Cestovo, on the Strumnitz-Doiran Railway line, and the enemy encampments in the Tohera Valley.

FEB. 14th.—Between Feb. 1st and 10th our pilots brought down 28 enemy machines, 14 of which were entirely destroyed and 14 severely damaged.

FEB. 15th.—On the night of February 12th-13th our air squadrons dropped over 4,500 kilogrammes (4½ tons) of explosives on the railway stations of Thionville, Conflans, Chambley, and Metz-Sablons. Fires were seen to break out, and explosions were heard in the stations of Chambley and Metz-Sablons.

FEB. 16th.—Two enemy aeroplanes last night [Friday] dropped several bombs in the region north of Nancy. A number of killed and wounded are reported among the civil population.

FEB. 18th.—During the 17th two German aeroplanes were brought down by the fire of our special guns.

During the same day and during the following night our bombarding aeroplanes made various raids against the railway stations of Thiaucourt, Thionville, Metz-Sablons, Pargny sur Moselle. The enemy establishments of Hirson and various aviation grounds received numerous bombs. A total of 13,000 kilogrammes (about 13 tons) of explosives was dropped and caused several fires and explosions in the bombed buildings.

The following semi-official Note was issued in Paris on Feb. 14th:—

Quite recently, while patrolling the Channel, two of our seaplanes observed an enemy submarine floating on the surface. Making a sharp turn, the pilot of the leading seaplane brought his machine into such a position towards the sun that he could see better without being seen. He then proceeded to attack the submarine, followed by the second seaplane. The submarine submerged, but the conning tower had not disappeared before the seaplanes, having dived to a low altitude, dropped their bombs right on their objective.

The leading machine then returned to its base for a further supply of bombs, leaving the other machine to keep a look-out. The latter, a few seconds after the attack, saw the forepart of the submarine emerge at an angle of 45 degrees. Then the submarine slowly rose to the surface, without, however, being able to regain a horizontal position, and again disappeared in a violent whirlpool.

Three times at short intervals the submarine attempted to rise to the surface, taking at each attempt a stronger list to starboard. Then the observer saw the whole of the submarine's port side exposed, while the submarine rested on its beam ends. Finally, the vessel disappeared without having succeeded in getting its conning tower above water.

\* \* \*

It is officially announced that no German aeroplanes approached Paris on Feb. 17th. A French aeroplane coming back from bombing the enemy lines was carried out of its course by a strong wind close to Paris, where it was unable to make itself recognised by the defences, which fired and gave the alarm.

\* \* \*

According to "L'Intransigeant," of Paris, a German chaser aeroplane which had lost its bearings was forced to land at noon on Feb. 16th between Vaudoy and Rozoy (Seine et Marne). The two aviators were taken prisoners.

A sergeant who was on the spot when the aeroplane landed prevented the occupants from setting fire to the machine, which was captured intact.

#### GERMANY.

##### OFFICIAL COMMUNIQUÉS.

FEB. 13th.—As a reprisal for the enemy air raid on Saarbrücken on Feb. 5th our aviators yesterday evening dropped bombs on the fortress of Nancy with good effect.

FEB. 15th.—During the month of January the enemy lost on the German front 20 captive balloons and 151 aeroplanes, 67 of which fell behind our lines. The rest were seen to fall within the enemy positions.

In aerial fighting we have lost 68 aeroplanes and four captive balloons.

FEB. 17th.—Our aviators last night attacked with bombs London, Dover, and Dunkirk, as well as the fighting forces on the North Coast of France.

FEB. 18th.—In the clear, frosty weather aerial activity was very lively during the day and night. Bombs were dropped extensively on military constructions behind the enemy front. One aeroplane attacked London.

During the last two days 16 enemy aeroplanes and two captive balloons were brought down in aerial fighting and by gunfire.

On Feb. 16th our aircraft attacked British seaplanes in the Southern Downs. The seaplanes were accompanying a convoy crossing from England to Rotterdam. One of our seaplanes was brought down in flames by Lt. Christiansen.

#### ITALY.

##### OFFICIAL COMMUNIQUÉS.

FEB. 12th.—One of our aviators shot down an enemy aeroplane above Beritago (Asiago Plateau).

FEB. 13th.—To the east of Conegliano (six miles north-east of British front at Montello) two enemy captive balloons were set on fire by English aviators.

\* \* \*

One day at the end of January twelve aeroplanes—Capronis and Savoias—and two airships navigated in the atmosphere of the Capital and Capitol, carrying two members of the Government and dropping inciting printed matter, the object of all of which was to stimulate enthusiasm for the new War Loan. From one airship the Under Secretary of the Treasury enthused the population; from the other the High Commissary of Aviation encouraged the offerings. Several of the Treasury and other officials were, of course, in attendance on the Ministers, and the whole affair was voted quite a live modern "stunt."

\* \* \*

It is with the greatest regret that all Italy has learnt of the death of Major Oreste Salamone, the popular hero of the Lubiana "Ca" raid, who lost his on returning from a starlight night raid on the same make of machine. He had had the Gold Valour medal since the well-known episode, and recently begged to be sent on active service again, though a bad casualty.

I believe his brevet dated from 1911, and he was certainly the first of the biplane Caproni pilots. He was born in 1889, held for some time the height record in 1914, had flown everything made, and was a "real indispensable" at the home camps,



*Where Flying Men are fitted out.*



## "All our Machines Returned Safely"

BALD official phrase, read by the man in the street with a joy none the less deep for his imperfect realisation of what it implies.

Not a single cold-benumbed hand failed at the controls, no eye or brain was so dulled with bodily misery that the faint grey smudges below lost their meaning as bearings.

He, the Airman, alone knowing what these dark and perilous excursions mean—he it is who alone realises the vital urgency of securing the world's best flying kit. He is the man you meet at *Dunhills*.

It weighs with him that *Dunhills'* experience in air-kit making—and that goes both to the infancy of flight—is backed by an earlier (and a long and distinguished) experience in the kindred problem of kit-making for motorists.

### LEATHER COMBINATION SUIT

*Lined soft, snug camel fleece.*

To knee. To ankle.

Tan Leather 9 gns. 10 gns.

Black " 10 " 11 "

Made with Map and other deep, useful pockets.

The Aviation Catalogue gives the rest of the kit, so send a card for a copy.

# Dunhill's

LIMITED.

2, Conduit Street, London, W. 1.

MANCHESTER:

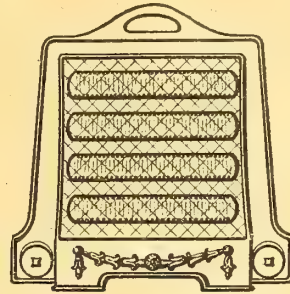
90 and 92, Gros Street.

GLASGOW:

72, St. Vincent Street.

## BELLING ELECTRICAL ACCESSORIES

### AIRCRAFT Manufacturing Purposes.



#### ELECTRIC FIRE.

OFFICE PATTERN. List No. 617.

An ideal fire for small offices, waiting rooms, passages, etc. We have also supplied a large number to Aerodromes for general heating. Numerous other designs are available.

PRICE 35/-

Dimensions—Height 17½ in., Width 17½ in., Depth 5½ in.



#### ELECTRIC

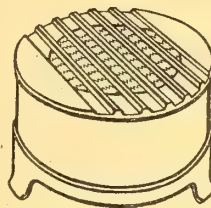
#### AIR WARMER.

List No. 960.

A reliable low temperature heating appliance, suitable for work rooms, etc. Can be used in any position without risk of fire.

PRICE 25/-

Dimensions—Length 15½ in., Width 6½ in., height 4½ in.



#### ELECTRIC

#### BOILING RING. List No. 7.

This will do all the same operations as an ordinary gas ring. Used for heating glue pots, and when loaded at 250 watts can be attached to any electric lampholder.

PRICE 15/-

Diameter 7 in.



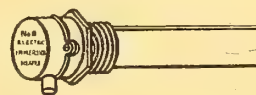
#### ELECTRIC

#### HOT PLATE. List No. 18

Useful for keeping food warm, and also for drying purposes of all kinds.

PRICE 100/-

Size 36 in. by 18 in.



#### ELECTRIC

#### IMMERSION HEATER.

A reliable appliance for heating water, oil and other liquids. Can be easily fitted to existing tanks, etc.



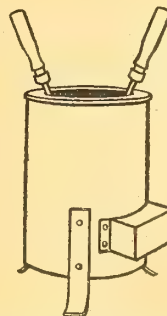
#### ELECTRIC

#### ENGINE WARMER.

For placing under engine in cold weather to prevent freezing. They are quite gas and fireproof.

PRICE 40/-

Size 12 in. by 7 in.



#### ELECTRIC

#### SOLDER POT. Type A.

This is the latest system for heating ordinary soldering irons, and consists of a pot of molten solder into which the irons are placed for a short time till heated.

PRICE 65/-

Dimensions—Outside diam. 8 in., inner pan 5½ in. diam. at top, Depth 7 in.

All the above prices are subject to an advance of 25 per cent.

Our Catalogue illustrates many other special appliances we make for Manufacturing Purposes, Munition and Factory Work, Hospitals, Mess Rooms, etc.

**BELLING & CO.,** MANUFACTURING ELEC. ENGRS.,

DERBY RD. WORKS, MONTAGUE RD., EDMONTON, LONDON, N. 18.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



whence he had better never have been ordered away. He had been invaluable at the new Paris Allies Technical Aerial Institute.  
T. S. HARVEY.

#### BELGIUM.

A frontier telegram via Amsterdam, Feb. 12th, relates a remarkable capture by a British air squadron of two German aeroplanes in full flight near Ghent. The British aviators surrounded their opponents, who apparently gave up the fight and meekly flew away in a southerly direction with the British squadron.

\* \* \*

An extraordinary act committed by the German authorities at Ghent against a British aviator was reported in a telegram to the "Telegraaf" of Amsterdam, on Feb. 12th, from the frontier. The aviator was taken through the streets of the city apparently with the idea of stirring up feeling against Great Britain among the population, some citizens having unfortunately lost their lives in the British air raids on German military establishments.

The result of this treatment was not at all what the Germans expected. The crowds did not dare to cheer the aviator, but there was no doubt as to their silent sympathy.

[It seems more likely that the pilot was merely being sent to the rear under escort.—Ed.]

#### DENMARK.

A message from Copenhagen dated Feb. 15th states that four German aviators, with two aeroplanes, were stranded on the Danish island of Manoe a few days ago. They have been interned.

#### INDIA.

According to a message from Colombo, dated Feb. 13th, Lord Montagu of Beaulieu, in an interview, said he was confident that the war will be won in the air, and that in the coming summer aircraft will show more decisive results than the most sanguine believers in aircraft imagine.

#### U. S. A.

A message from New York on Feb. 13th states that a permanent aeroplane mail service between New York, Philadelphia, and Washington, a total distance of 228 miles, is to be established this spring by the Government. A special postage rate of a shilling an ounce will be charged to begin with. Post Office specifications call for five machines which have stood satisfactory tests in army and navy service. Each will be required to carry 300 lbs. of mail not less than 200 miles without stopping, at a maximum speed, with full load, of 100 miles an hour, minimum 45 and a climbing speed of 6,000 feet in 10 minutes.

[The imposition of such high rates is sufficient to doom any postage system to failure.—Ed.]

\* \* \*

A message from Fort Worth, in Texas, dated Feb. 14th, states that Air-Lt. Peyton March, son of General Peyton March, the newly appointed Chief of Staff of the United States Army, has died from the effects of injuries suffered in consequence of his machine falling.

\* \* \*

A message from Washington dated Feb. 15th states that the Deficiency Appropriation Bill providing as a matter of urgency for an appropriation of £200,000,000, the largest appropriation in the history of Congress, has been favourably reported upon by the House of Representatives.

It is said that it provides for, among other things, over £55,400,000 for the purchase of aeroplane bombs, but probably this means bombing machines, or at most bombing apparatus of all kinds. Obviously 25 per cent. of so big a vote would not be for missiles only.

\* \* \*

Reuter's correspondent with the American Army in France writes on Feb. 16th as follows:—

An American field hospital town within our lines was apparently the target for a German aeroplane which flew over last night and dropped a number of extremely heavy bombs.

The hospital, in which were a number of wounded, was the nearest building to the place where the German airman dropped two sets of bombs. Luckily, none hit where they were intended, although the town and the hospital patients were shaken.

[The attacks by German aviators upon hospitals seem to be perpetrated with the brutal but practical intention of jeopardising the recovery of the sick and wounded inmates.—Ed.]

\* \* \*

Cadet Linley Haines de Garno, a young American attached to the R.F.C., was killed in an aeroplane accident at Radlett, Herts., on Feb. 18th.

#### POLICE NOTICE.

Scotland Yard has issued the following notification: It is found that bombs from enemy aircraft may be dropped on houses or in streets causing casualties, and owing to the conditions which prevail at the time of an air raid there may be some delay in reporting what has happened to the local police. The Commissioner thinks it desirable, therefore, to invite the occupiers of damaged premises or of neighbouring houses or any other person who has first knowledge of the happening, A Greeting from the Balkans, drawn and reproduced in the Field.

to acquaint the police at once by the nearest telephone, the caller giving the call "Police" and specifying the exact locality. This will enable the police to give immediate help by the dispatch of surgeons, nurses, first-aid workers, ambulances, and constabulary, either from the reserve at headquarters or from the nearest police station. The Controller of the London Telephone Service will give priority to such messages as far as practicable.

#### AN EXPANSION OF PREMISES.

Following is the list of the buildings that are shortly to be taken over by the Aircraft Production Department of the Ministry of Munitions:—

Imperial House.

York House.

Alexandra House.

Penhouse Corner.

Messrs. Griffin's Buildings.

Central House.

West Africa House.

International Buildings.

Windsor House.

Regent House.

Carleton House.

Kingsway House.

Kingsway Hall, Kodak House, and the offices of the West London Mission are not included in the block.

With regard to the complaint against the action of the Government on the ground of the high cost, it is stated on good authority that the figure which has been given, £800,000, is greatly in excess of the actual cost.

[It is strange that information of this character is given officially to the Press in view of the penalties incurred by the incautious editor who divulges the location of a new split-pin factory. It seems to confirm the current belief in the dire fate awaiting any German aviator who damages a British Government office.—Ed.]

#### AIR RAID WARNINGS.

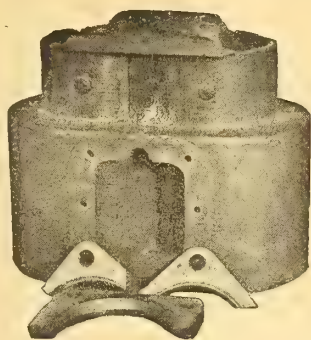
On the invitation of the Home Secretary a conference of representatives of the local authorities of London was held at the Home Office on Feb. 13th to consider questions relating to shelters and other matters connected with air raids. Mr. Brace, the Parliamentary Under Secretary to the Home Department, presided in the absence of the Home Secretary. The Lord Mayor and representatives of the London County Council and of most of the metropolitan boroughs were present.

The Commissioner of Police explained that about 1,650 emergency shelters have been scheduled, but he laid stress on the point that the great majority, though affording good cover against splinters, are not bomb-proof, and are provided, primarily, for persons who are in the streets when the warning is given. It is now well known that persons in the open run a great risk of



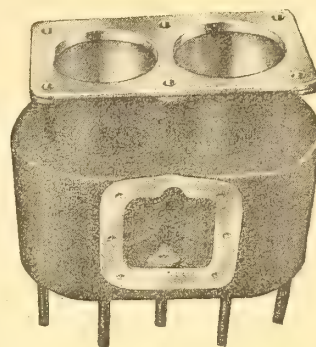
HEADQUARTERS  
Royal Flying Corps  
MACEDONIA  
XMAS 1917





## Why ordinary welding is so unsatisfactory

A few notes, which are to be continued, giving the reasons. They are taken from our correspondence files and describe the experiences of some of our customers before coming to us.



### Note 2.

A badly-smashed part, after having been welded up, appears to all intents and purposes satisfactory. It is re-assembled, nothing will fit, the bearings are out of line, the faces distorted, and the part is useless.

### Remarks.

The man who set the part up for welding did not know his job; the man who did the welding was little better; and the people who sent it out don't deserve another order.

You are guaranteed against such incompetency in all repairs you send to

## THE NEW WELDING CO.

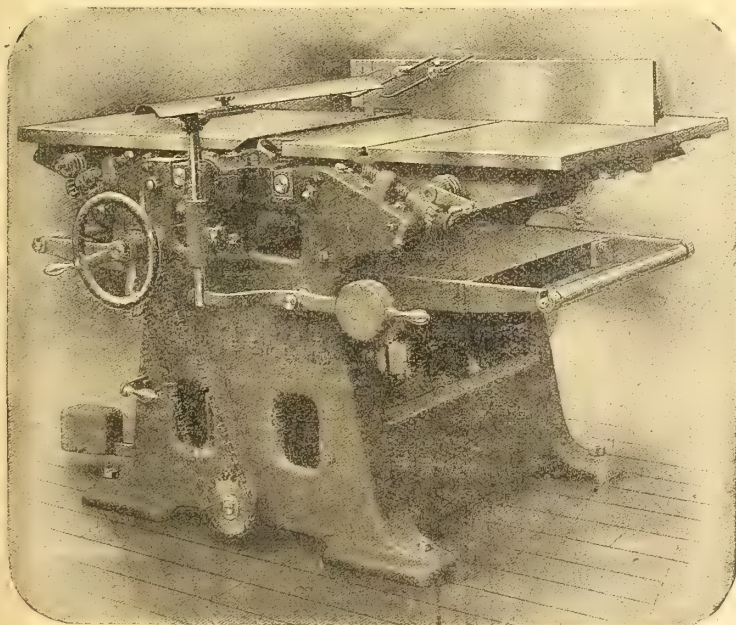
26, Rosebery Avenue, LONDON, E C.1.

Telephone—5252 Holborn.

Telegrams—"Windoneeda, Holb, Lon'on."

# THOS. ROBINSON & SON, Ltd.

## ROCHDALE, ENG.



## AIRCRAFT MACHINERY

### Hand and Power Feed Planer

FOR

SURFACING, THICKNESSING,  
PLANING OUT OF WIND,  
— JOINTING, RIB BATING, —  
BEVELLING & CHAMFERING.

Type ME.



injury from splinters of bombs and shells, but that any ordinary house affords good cover against splinters if care is taken to avoid places where fragments of bombs or shells might enter by skylights, doors, or windows. The first consideration, therefore, is to provide shelter for those who are not able to reach home.

Those who are in their homes should remain there, and not flock to shelters which are no more secure than their own dwellings against a direct hit by a bomb. Very few buildings in London can be considered bomb-proof, and there is a risk of grave disaster if large numbers of people leave their homes and crowd into the shelters. The Commissioner mentioned that notices advising the public not to leave their homes had been issued by several local authorities, and the suggestion that this advice might be generally given and followed was unanimously approved.

Several representatives drew attention to the unofficial organisations known as "patrols," who in some districts warn the inhabitants to make for shelter when warning has been given, and, while one or two representatives thought that they were useful, the general opinion appeared to be against their continuance.

The representatives of the local authorities were unanimously in favour of warning being given by maroons up to midnight. The representatives of a few authorities were in favour of the use of sirens to supplement the maroons, but the majority, especially those whose areas adjoin the river where sirens are constantly heard, were against the use of sirens at any time. The conference, with only a few dissentients, resolved against the use of maroons after midnight. In consequence, the Commissioner has decided that the maroons (which are at present used up to 11 o'clock) shall be used till midnight, and that after that hour the warning will be given by police whistles and the display of "Take cover" notices, as hitherto.

The conference unanimously approved of the decision that bugles should be used for the "All clear" signal, and that sirens should in no case be used for "All clear."

#### THE GERMAN OUTLOOK.

A brief telegram from Düsseldorf to the "Cologne Gazette" discloses the fact that all the presidents of provinces and representatives of interested towns have recently visited Hindenburg's Headquarters to discuss measures for defence against air attacks in West Germany and South Germany. On his return home the chief Burgomaster of Düsseldorf made a comforting report to his Town Council.

According to the "Cologne Gazette" summary, the military authorities insisted that there is "no reason for uneasiness."

They declared to be "unfounded" the "opinion which is widely held that the Americans will invade Germany with a large number of powerful aeroplanes." The authorities "expressly insisted that this American peril does not exist." There was then a discussion, in which the representatives of raided German towns took part, and the conference is said to have reached "complete agreement" about the measures of defence.

There was a difference of opinion as to what people should do during raids. It was agreed that people who were at home should stay there. The military authorities argued that during night raids it is best to avoid all assembling of people and that people should not go into the cellars. The representatives of raided towns, on the other hand, argued that people should be encouraged to go under ground, if good cellars are available. Finally, the conference expressed the opinion that "the rumours about number and extent of air attacks and the damage done are greatly exaggerated and stupid."

The "Frankfurter Zeitung" announces that the Frankfurt authorities have definitely decided that no alarms should be given in the event of air raids at night; it seems that the present rule is that there shall be no alarm between 11.30 p.m. and 5 a.m.

It was argued at a conference between the military and municipal authorities that alarms, if they are given at all, must be given as soon as the enemy aviator comes within about 60 miles of the town, even if it is not known what direction he is going to take. It was said that this would lead to constant uneasiness, which would involve many dangers, especially the danger of lights being lit near uncovered windows. It was also urged that the flight to refuges may lead to accidents in the dark, and that it is much better for invalids and small children to be at home. All these views were pressed by the military authorities, and were finally accepted by the municipal authorities, especially as Freiburg, Trier, and Saarbrücken, which were described as "specially menaced by night raids," have abandoned their former practice of giving alarms at night.

[Obedient people, the Germans.—Ed.]

#### HUN PHILOSOPHY.

From the "Daily Express" of Feb. 13th:—

Temporary suspension does not seem to agree with the Berlin "Deutsche Tageszeitung." Suffering from all those symptoms of the-morning-after-the-night-before which the Teutonic tongue crams into the portmanteau-word "Katzenjammerlichkeit," it



**Alardux is the New Aluminium Flux**

**A Welding Flux of exceptional merit**

**May we send you a sample?**

**The Alardux Co.,  
23, Fleet Street,  
London, E.C.4.**

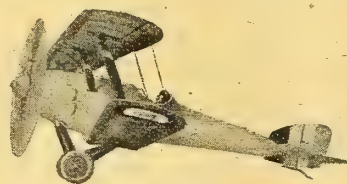
City 866.

## UNDERCARRIAGES

**A. V. ROE, TYPE 504.**

**FOR IMMEDIATE DELIVERY.**

ENQUIRIES INVITED FOR WOODWORK AND METAL SPARS.



**JOSEPH G. NAVARRO,  
AERONAUTICAL ENGINEER,  
BRANSTON ROAD,  
BURTON-ON-TRENT**



*Of special  
interest to Government  
Contractors.*

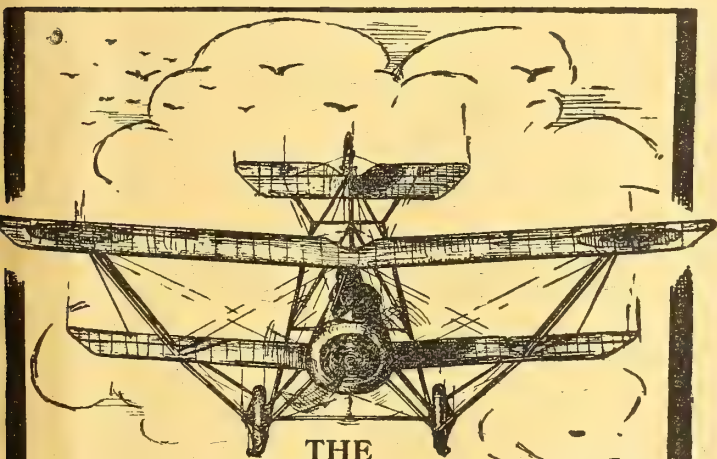
**J.B. BROOKS & CO.**

Contractors to the Admiralty, War Office,  
Air Board, Ministry of Munitions, etc.  
And the Leather Specialists with  
the Largest Works, Finest  
Equipment, Best Facilities, and  
widest experience in the Trade,  
invite enquiries for Articles,  
Parts, Fitments, and Cases of

**LEATHER**

*J.B. Brooks & Co. Ltd.  
104 Criterion Works  
Birmingham.*

1131



THE  
**CAMBRIDGE  
SCHOOL OF FLYING**

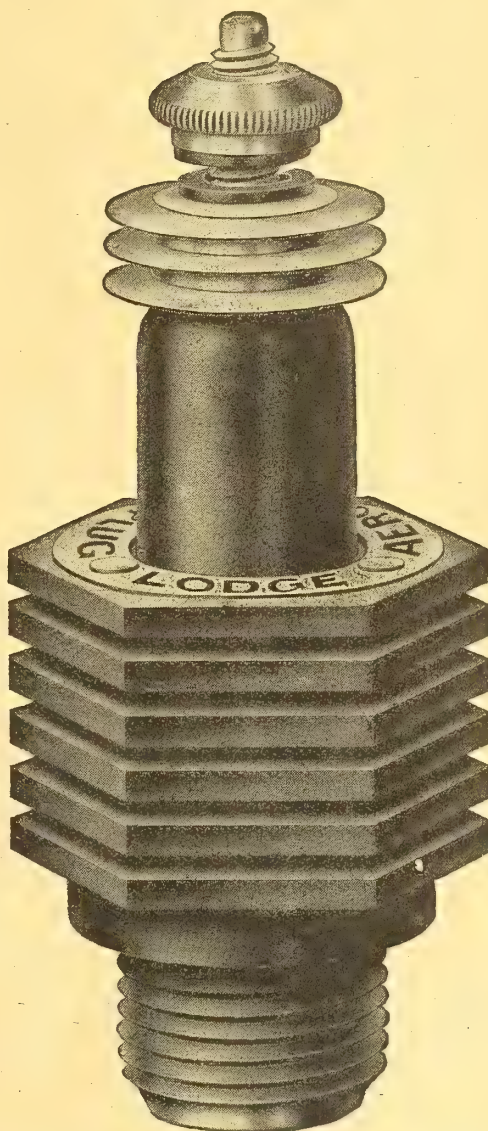
30b, St. Andrews Street, Cambridge.

*Write for particulars of Courses in*

- (1) **FLYING** for R.Ae.C. Pilot's Certificate.  
Individual attention, best aeroplanes,  
large machine/pupil ratio. Immediate  
vacancies.
- (2) Aero-Engineering by **CORRESPONDENCE**,  
including Aeroplanes, Airships, Engines,  
Stress Calculation, etc.; Draughtsman-  
ship, Design, Experimental Data, etc.

**CHARGES MODERATE. INSTRUCTION THOROUGH.**

The Verdict of the Air.



There are Two kinds of Engine Tests:—

**On the Bench**

and

**In the Air.**

Ask the men who fly which plug is best.

The invariable answer is

**LODGE**

KINDLY MENTION "THE AEROPLANE"

WHEN CORRESPONDING WITH ADVERTISERS.



urges the total destruction of London and the wiping out of at least 400 English towns! :—

If we are in a position to destroy the whole of London, it would be more humane to do so than to allow one more German to bleed to death on the battlefield. To hesitate, to surrender ourselves to feelings of pity, would be unpardonable.

More than 400 mercantile ships have been stolen from us by England. Our answer should be that for every German ship at least one English town should be reduced to ruins by our airmen.

Far better were it for us if England, France, and Russia should call us barbarians than that they should bestow on us their pity when we are beaten. Softness and sentimentality are stupidities in war time.

### THE INVASIONS OF ENGLAND.

Two bombs, dropped simultaneously during the raid upon London on Feb. 17th, struck the upper part of an hotel within a few yards of each other, and fell close beside it, but beyond throwing down some ornamental stonework and shattering many windows they did very little damage to the structure. A lady who was in the building died during the night from shock, but none of the other occupants received any injury.

Unfortunately, however, a number of people had gathered in an archway close to where the bombs fell, either for shelter or to watch the raid, and the explosion caused havoc among them, several being killed, while others were badly injured, and a score of others received hurts which were not serious enough to necessitate retention in hospital.

### FLAX SUPPLIES.

The "Daily Mail" of Feb. 16th says :—

A letter from Mr. Ernest S. Brown, a director of Andrews Brothers Proprietary Limited, 51, Milton Street, E.C.2, was published in the "Daily Mail" of Feb. 11th, showing the enormous increase in British exports to Norway of linen and thread. These products of the flax industry are essential for aeroplanes. At Belfast on Jan. 31st it was reported: "They were so short of flax that the trade was faced with disaster."

An Order in Council dated Feb. 8th now prohibits exports of linen manufactures, other than wearing apparel, to all destinations without a war trade licence.

"Why was this not done when Riga fell and the only remaining great source of the world's supply of flax became the monopoly of the enemy?" now asks Mr. Brown. "For close on three

months things were allowed to drift and nothing was done to restrict the export of the material so vital to our air offensive. It has been the same throughout with cotton, magnetic ore, cement, and now linen."

### THEN—AND NOW!

#### OR, THE WAIL OF THE WAR-WORKER.

In other days (ah, happy days of old!)  
I'd trill a stave to welcome jocund Spring:  
My heart rejoiced; of lawns strewn crocus gold  
I'd raise a lilt; of larks upon the wing;  
Of slender boughs that coral blossom bore  
Ah, happy days gone by—those merry days of yore!

Of glinting streams that did Sol's rays reflect  
I sweetly sang (at least, I did my best!)  
And should my ear a whirring drone detect  
My nose against the casement swift was pressed.  
Oh, pioneer, recall those days long past,  
Acquiring love of flight the die was cast!


But now! I have no heart to sing or joke,  
No time to watch the myriad "airmen" thread  
The fleecy clouds (such thoughts low sobs provoke);  
My hours are spent in City office dread.  
Pilots do "banking" high in air refined,  
I, chained to earth, try the financial kind.

On War Loans, Bonds, Consols I draw a veil,  
I would not bore you with my piteous plight;  
My squeaking quill oft drowns a muffled wail  
As thoughts *will* wander to a moonlight flight  
Or looping trip. Ah, dear old happy time!  
Sweet memories of yore, in Spring sublime.

F. E. B.

### REPRISALS.

The sentence of ten years' penal servitude passed on two British flying officers by a German court-martial for dropping leaflets over the German lines is to be made the subject of reprisals by the British Government unless the officers in question are released from prison and treated as ordinary prisoners of war. This announcement was made on Feb. 5th by Reuter's Agency in the following statement :—



**Bowden Wire Ltd.**  
London  
VICTORIA ROAD  
WILLESDEN JUNCTION  
NW 10

THE varied uses and adaptations of Bowden Wire mechanism are recognised by almost every department of State Service. The war work which we have in hand for Home and Allied Governments precludes for the present our acceptance of private orders.

Established 1897.



THE  
**Eastbourne Aviation Co. LTD.**

ESTABLISHED 1911

THE EASTBOURNE AVIATION CO. LTD.

**AEROPLANE CONSTRUCTORS**  
Contractors to the Admiralty

THE S.B.A.C. SOCIETY OF BRITISH AIRCRAFT CONTRACTORS

TELE { GRAMS: Aircraft } EASTBOURNE  
PHONE: 1176

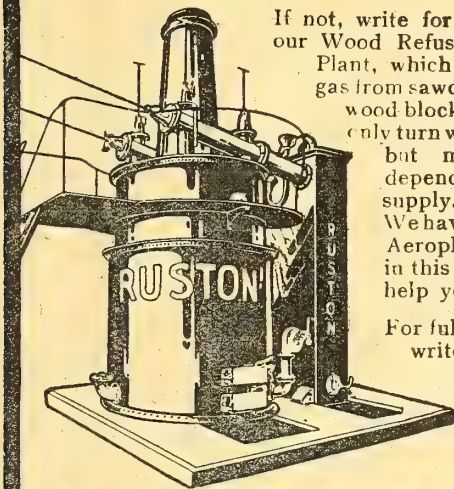


# What do you do with your Waste Wood?

Turn  
it into  
**Power & Profit?**

If not, write for particulars of our Wood Refuse Suction Gas Plant, which will generate gas from sawdust, chippings, wood blocks, etc., and not only turn waste into profit but make you independent of coal supply. We have helped other Aeroplane factories in this way. May we help you?

For fuller particulars write, on business note paper, mentioning **AEROPLANE**, to **Sole Makers:**



**RUSTON & CO. LTD. LINCOLN**

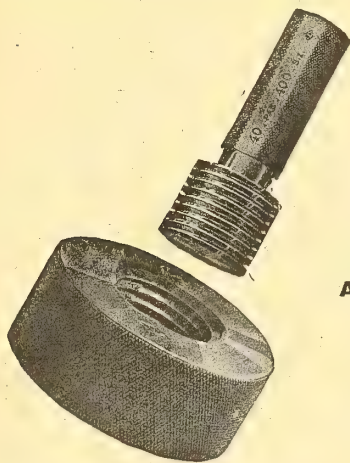
# LIMIT GAUGES

AS SUPPLIED TO

**A.I.D.**

AND

**THE MINISTRY OF MUNITIONS.**



**ABSOLUTE  
ACCURACY.**

Particulars from

**LEO. RIPAUT & CO., 64a, POLAND ST., LONDON, W.1**  
Wires—Ripault, London Phone—Gerrard 7758.

## The Book of the Hour.

# "AIRCRAFT IN WAR AND COMMERCE."

By **W. H. Berry.**

Introduction by  
**LORD MONTAGU.**

Brilliantly Illustrated.  
By **Geoffrey Watson.**

**1/6**  
NET.

**1/6**  
NET

Of **HORACE MARSHALL & SON**, Temple House,  
and 125, Fleet Street, London, E.C.; or

**E.D. J. BURROW & CO., LTD.**, Regent House  
(Kingsway Bureau); and all Booksellers.

on a "Belfast Roof" is an ideal covering for Hangars. Any width

**UP TO 100 FEET  
CLEAR SPAN.**

Outlasts galvanized iron, more equable temperature.

**BRITISH & BEST**

Write for Booklet "R."

49

**D. ANDERSON & SON, Ltd.**, Lagan Felt Works, Belfast; and Roach Road Works, Old Ford, London, E.



The German Government has been informed that His Majesty's Government do not admit that any breach of international law has been committed by Capt. Scholtz and Lt. Wookey, the British flying officers who have been sentenced to a term of imprisonment for distributing leaflets from the air. It is pointed out that this has been repeatedly done by German and Austrian aviators.

It has been intimated that unless these officers are released the British Government will be compelled to resort to reprisals in accordance with the arrangement arrived at by Lord Newton's Mission at The Hague. This provided that a month's notice of reprisals should be given.

This warning has been conveyed through the usual diplomatic channel, that is through the British Legation at The Hague, to the Dutch Government, and the Swiss Legation in London has also been informed.

#### THE VALUE OF IMAGINATION.

According to the "Daily Express" of Feb. 11th:—

The Cologne "Volkszeitung" has turned on a phantom German "who was interned for three years in England" to talk about London under the air raids.

The story told by this ingenious gentleman is as follows:—

WE HAVE INVENTED

# THE

NON-EVAPORATING

# DOPE POT

ARTHUR HILL & Co.,  
SHEET METAL WORKS,  
SILCHESTER ROAD,  
LONDON, W.10. Phone—1443 PARK.

Nothing could be more terrible to witness than the situation in London on the days when German aviators pass over the city.

While the underground railway stations are thronged with fugitives, an endless array of demolished tramcars obstructs the streets. Their ruins, as well as those of entire districts which have been devastated by some air attack on a powder factory, remain for weeks encumbering the streets because of the lack both of workers and of building material of all kinds.

No German who has stayed three years in England, even though interned, can possibly have any doubt as regards England's ultimate subjugation. It is a mathematical certainty.

[It is not clear from the report whether the German aviators or the refugees are supposed to be responsible for the demolished tramcars, or whether the tramcars demolish themselves in an effort to camouflage themselves a rubbish heap.—Ed.]

#### PRESENTATION AEROPLANES.

An Imperial Air Fleet First Unit aeroplane, subscribed for at a cost of £2,100 by members of the Huddersfield Chamber of Commerce, was on Feb. 9th, at Huddersfield, presented to the Dominion of Canada.

Lord Desborough, president of the Imperial Air Fleet Committee, said that these presentations by Chambers of Commerce were

*In Preparation. Ready Shortly.*

*1/6 net post free 1/8.*

## The Aeroplane Blue Book

A DIRECTORY OF AIRCRAFT FINANCE

By G. A.

To be published by The "Aeroplane" & General Publishing Co., Ltd.,  
2, Breems Buildings, E.C.

THE large and increasing number of Aeroplane Companies make it an urgent necessity to the many interested in the industry to have, in a concise and handy form, a reliable Work of Reference. "The Aeroplane Blue Book" will contain particulars of all the principal public Aeroplane and kindred Companies, giving:—

The Capital of each Company and how divided.  
The Amount is paid up and Loans and Mortgages.  
Names of Directors and other Officers.  
Registered Offices.  
Date of Incorporation.  
Profits and Dividends paid and declared.  
Date of making up Annual Accounts and when submitted.  
Extracts from last Balance Sheet and Director's Reports.  
Financial Position, etc. with latest Market Quotations.

FOR ADVERTISING SPACE AND FULL INFORMATION, PLEASE ADDRESS:  
The "Aeroplane" Advt. Department, 166, Piccadilly, W.

# Bowden, Tyseley.



**BOWDEN  
CONTROLS  
and  
BOWDEN CABLES**  
for all  
**AEROPLANE  
PURPOSES.**

Quotations on application.

Note Address—

**The BOWDEN BRAKE  
Co., Ltd., Tyseley,  
B'HAM.**

R. H. S.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

## AIRCRAFT COMPONENTS

QUICK DELIVERY  
OF ALL  
DESCRIPTIONS OF  
AEROPLANE  
COMPONENTS.



METAL FITTINGS,  
ETC., ETC.

'PHONE: LONDON WALL 6725.

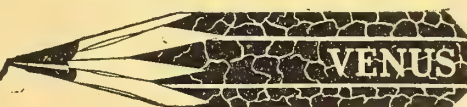
**National Aircraft Mfg. Co.**  
15, HACKNEY ROAD, LONDON, E.2



# VENUS PENCILS

IT is important to know that you cannot buy a faulty Venus Pencil—no imperfect lead is ever sent out of the factory. The lead of all the 17 degrees is brought to the highest pitch of excellence and encased in selected straight-grained cedar wood. These points make for economy.

17 Grades, 6B (Softest) to 9H (Hardest) Blacklead—also Copying:  
OF ALL STATIONERS, STORES, ETC., THROUGHOUT THE WORLD  
"VENUS," 173/5, LOWER CLAPTON ROAD, E.5.



## OFFICERS' UNIFORMS DRY CLEANED AND TAILOR PRESSED.

### PRICE LIST.

Caps, soft ...	...	each, 6d.
Tunics ...	...	each, 2/.
Breeches ...	...	pair, 1/.
Slacks ...	...	pair, 1/.
British Warm ...	...	each, 3/.
Fur-lined Flight Coat,	...	each, 6/.
Leather Waistcoat	...	each, 1/6.
Puttees ...	...	pair, 6d.
Gloves, Fur ...	...	pair, 6d.

Time, 3 days.

Carriage paid one way exceeding 10/.

**W. WARE & CO.,**  
GRAYS AND TILBURY DYE WORKS,  
GRAYS, ESSEX. Tel. TIL, 536.

### CHANGE OF NAME!!

**ACETYLENE**  
**EQUIPMENT**  
Formerly the  
Acetylene Illuminating  
Co., Ltd.  
**COY., LTD.**

The Pioneers of  
the Oxy-Acetylene  
Industry.

MANUFACTURERS AND SUPPLIERS OF  
OXY-ACETYLENE EQUIPMENT & ACCESSORIES OF ALL KINDS

#### High Pressure System:

Dissolved Acetylene, Cylinders  
and Gas Blowpipes, &c.

**D. A.**

#### Low Pressure System:

Acetylene Generators, Purifiers, Safety  
Valves, Blowpipes, &c. (Trade Mark  
"Endazzle.")

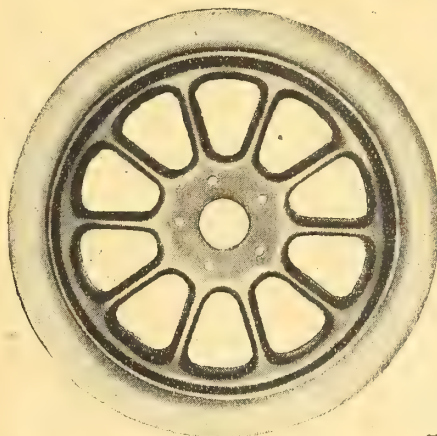
Address:

**268 & 270, SOUTH LAMBETH ROAD,  
LONDON, S.W.8.**

Branches in all Industrial Centres.

Telephone—Brixton 2171 (3 lines). Telegrams—Endazzle, London.

## Unbreakable



EASIEST TO  
DETACH:  
EASIEST TO  
CLEAN:

Joseph Sankey  
& Sons, Ltd.  
Hadley Castle Works  
Wellington.  
Shropshire.

**Sankey**  
PATENT  
**Steel Wheels**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



a concrete expression, in the most useful form at the present time, of the sympathy which bound men of business in the great Dominions with those of the Mother Country.

Sir Edward Morris (Newfoundland) agreed that presentations of this character strengthened the bond between the Mother Country and the Dominions. This was very necessary, because during the last three and a-half years trade had been diverted from this country to foreign countries, and a very much greater and more persistent effort would have to be made by our Chambers of Commerce and merchants generally if they were to get back that trade.

Sir George Perley (High Commissioner for Canada) said that nearly half of the pilots and observers in the British Air Services were Canadians. Maj. Bishop, R.F.C., a Canadian officer, had brought down forty German aeroplanes.

Maj. Baird, M.P., Secretary to the Air Council, said that there was an immense future for aircraft in the development of commerce after the war, and he looked forward to the time when it would be possible to go from London to Huddersfield in a great deal quicker time than by train, to land somewhere near the town, and continue by air to Canada.

This country would cease to be an island unless they could

defend it from the air, just as in the past they had had to defend it from the sea.

The aeroplane was presented to Lord Desborough by Mr. E. J. Bruce, the president of the Huddersfield Chamber of Commerce, and accepted first by Sir George Perley on behalf of the Canadian Government, and then by Major Baird for immediate service on the Western front. It was named "Huddersfield" by Mrs. E. J. Bruce.

### TO KILL TIME.

Useful and profitable employment is being provided for the men engaged at the anti-aircraft gun and searchlight stations in the outer defences of London. A gardener has visited a number of stations in Kent and Surrey, and has selected land suitable for vegetables. Crops will be sold to the officers and non-commissioned officers' messes, and the proceeds will be distributed among the gardeners.

### A CHANGE OF ADDRESS.

The Nottingham Aircraft Manufacturing Co., Ltd., wish it to be noted that their offices have been removed from 32, King Street, Nottingham, to Castle Meadow Road, Nottingham, and that in future all correspondence should be sent to the new address.

# T.W. PALMER & CO.

MERTON ABBEY IRONWORKS  
LONDON · S.W. 19 ·

DESIGNERS · MANUFACTURERS AND  
ERECTORS OF EVERY DESCRIPTION OF  
AIRCRAFT BUILDINGS  
TEMPORARY OR PERMANENT

~ WORK · CARRIED · OUT · TO · OUR · OWN · OR · CUSTOMERS · DESIGNS ~



ESTIMATES  
FREE

## Aeroplane Construction

In aeroplane construction the vital factor is "how many machines can be turned out in a given time." This depends entirely upon the efficiency of the machinery employed. And no machine reaches its highest point of production until its clutches, brakes, etc., are fitted with Ferodo Fabric.

Ferodo Fabrics are the most efficient transmitters of energy. Leather, wood, textile beltings, etc., are out of date for Friction drives and Braking purposes. The moment they become soaked with oil they are useless; Ferodo Fabrics never slip, never seize; are not affected by water, oil or acid, and are absolutely reliable under all conditions.

**THE HERBERT FROOD CO. LTD.**  
Works: CHAPEL-EN-LE-FRITH.

Contractors to the War Office and Admiralty, London General Omnibus Company, and Underground Electric Railways of London and Paris.

Depots at London, Birmingham, Belfast, Bristol, Cardiff, Edinburgh, Glasgow, Liverpool, Manchester & Newcastle.

# FERODO

## Friction Surfaces

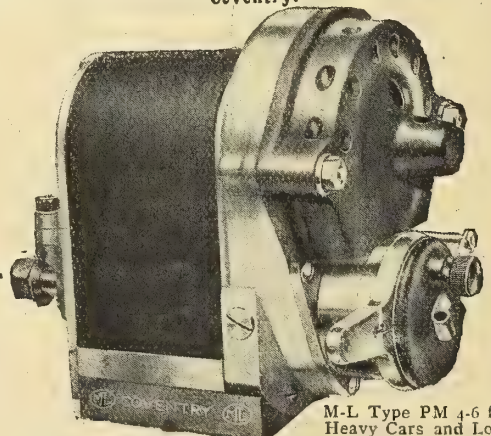


## All-British Magnetos

M-L MAGNETOS are lighter, smaller yet stronger than any pre-war magnetos of same electrical capacity.

They are of British design and built by British labour in a British-owned factory. They have been supplied in large numbers for work of National importance.

The M-L Magneto Syndicate, Limited, Victoria Works, Coventry.



M-L Type PM 4-6 for Heavy Cars and Lorries.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



SUNFLOWER



TRADE MARK

FLUX

FOR

ALUMINIUM

(LET US SEND YOU A SAMPLE.)

Sole Manufacturers:

IMPERIAL LIGHT LTD.,

Telegram: 123 VICTORIA STREET, Telephone:  
 "Edibrac," LONDON, Victoria  
 Phone, 3540  
 London." S.W.1. (3 lines.)

**BUY**  
**Your Streamline Wires**  
**FROM**  
**THE ORIGINAL MAKERS**  
**BRUNTONS**  
**MUSSELBURGH,**  
**SCOTLAND.**

We can supply Wires, plain,  
 screwed or fitted with Fork or  
 Universal Joints.

THE USE OF  
**NAYLOR'S**  
**Aero Varnishes**

WILL ENSURE A  
 PERFECT FINISH

Many years' experience  
 combined with up-to-date  
 methods and scientific se-  
 lection of materials ensure  
 the production of var-  
 nishes unexcelled for  
 durability and reliability.

Some Specialities  
 for Aero Work

Woodfillers, Stains, Air  
 Screw Varnish, Spar  
 Varnish, Float Varnish,  
 White Copal Finish for  
 Dope, Enamels, Engine  
 Paints, Etc., Etc.

Free Samples for trial  
 on application.



**NAYLOR BROTHERS (London) Ltd.**  
 Contractors to all Government Departments.

Offices: 407/9, OXFORD ST., LONDON, W. Works: SOUTHALL MIDDIX.

AEROPLANE



ACCESSORIES

7 Years' Experience.

KINDLY MENTION "THE AEROPLANE"

WHEN CORRESPONDING WITH ADVERTISERS.



**STAMPINGS  
WASHERS  
REPETITION WORK**  
in all Metals

**BRIGHT DRAWN STEEL**  
FOR

**AIRCRAFT and MOTOR WORK**

**J. B. GUTHRIE & SON**

(JOHN J. GUTHRIE)

**30, ST. MARY AXE, LONDON**

TELEGRAMS—BUSIRIS LED, LONDON. E.C.3.  
TELEPHONE—AVENUE 1432.

**HEATING, DRYING  
AND VENTILATION.**

**Kinnell's**

OF DOPE SHOPS, AERODROMES AND  
AIRCRAFT FACTORIES, &c. OF EVERY  
DESCRIPTION. List 1134 free.

**C. P. KINNELL & CO., LTD.** Phone—  
Hop 372  
65, SOUTHWARK ST., LONDON, S.E.1.

**Aeroplane Steel Sheets**

as supplied by us to

**The Royal Aircraft Factory  
and leading Aeroplane Makers**

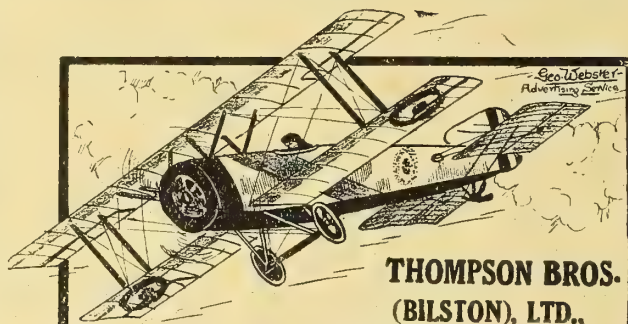
Guaranteed to comply with the R.A.F. No. 9A  
specification. Stocked in all gauges. (Sheets  
are passed and stamped by the "A.I.D.")

**BERNARD NICKLIN & CO.**

IRON AND STEEL WAREHOUSE  
SMETHWICK, BIRMINGHAM

Telegraphic Address:  
"Bernico," Birmingham.

Telephone No. 1  
224 Smethwick.



**THOMPSON BROS.  
(BILSTON), LTD.,**

— FOR —

**UNDERCARRIAGES  
TUBULAR FRAMEWORK**

**AERO. DEPT., BILSTON, Staffs.**

**THE POOLE AVIATION CO.**  
**POOLE, DORSET.**

*Contractors to H.M. Government.*

**Spares and all Parts of Machines.**

**ENQUIRIES INVITED.**

'Phone: Poole 54.

'Grams: Aviation, Poole

**WOOLER ENGINEERING CO. L<sup>TD</sup>**

Specialise in MACHINED METAL FITTINGS,  
and can quote for PROMPT DELIVERY your  
requirements in EYE BOLTS, SOCKETS,  
ELEVATOR and FLAP LEVERS, HINGES, &c.

Do you want your Stampings and Castings  
Accurately Machined? Send us your enquiries.

Large Stock of All Sizes R.A.F. No. 3 A Spec.  
Limited Stock R.A.F. No. 1 E Spec.

Offices and Works:

**OLD OAK COMMON LANE,  
WILLESDEN JUNCTION, N.W. 10.**

Phone: Willesden 117

Telegrams: Two Stroke, London.

**Lang Propeller LTD.**

Contractors to  
the Admiralty  
and War Office.  
**WEYBRIDGE,  
SURREY.**

Telephone—East 3833.

**THE STANDARD Aircraft Manufacturing Co., Ltd.**

**28, BOW COMMON LANE, LONDON. E.3.**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



**"CROID"****LIQUID GLUE**

'Approved' by 'A.I.D.'

Sole Manufacturers:

**The Improved Liquid****Glues Co., Ltd.,**

Gt. Hermitage Street

London, E.

Contractors to H.M.

Government.

**The Air Navigation Co., Ltd.****BLERIOT & SPAD  
AIRCRAFT WORKS,**  
ADDLESTONE (SURREY).**Contractors to War Office and  
Admiralty.****Flying Ground — Brooklands Aerodrome.****NORBERT CHEREAU, Managing Director.**

Telegrams—Bleriot. Weybridge.

Telephone—353 Weybridge.

**The Best  
Piston  
Rings**Scientifically designed. Made from  
high tensile cast iron and hammered  
to give an even radial distribution  
of pressure. Castlight. Sizes up to  
30 in. diam.**The BRITISH CHUCK  
& PISTON RING CO. LTD.**  
Holbrook Lane, COVENTRY**Berling Magneto**  
insures a hot, fat  
spark at any  
altitudeWorth more  
Does more**Manufactured  
by the  
Ericsson Mfg. Co.  
Buffalo N.Y. U.S.A.**YES.  
Telegrams:  
Y.E.S., LEEDS.**Y.E.S. PHOSPHOR BRONZES**

(Cast by 'EATONIA' Process.)

**Y.E.S. 'AERO' BRONZE**

(Under A.I.D. Inspection.)

**PERFECTLY ROUND SMOOTH BARS,**  
for Automatic Machines, up to 3' 6" long.**THE MOST DURABLE YET PRODUCED.**

SOLE PRODUCERS AND SELLERS:

**YORKSHIRE ENGINEERING SUPPLIES, LTD.,**  
WORTLEY, LEEDS.YES.  
Telegrams:  
Y.E.S., LEEDS.

YES.

YES.

**Send us your enquiries**

FOR

S.E.5	....	10400-6
"	....	10471-1
"	....	10307-3
De H.	....	6807
"	....	6494
R.E.8	....	7948-1/2/3

**WE KEEP OUR PROMISES FOR DELIVERY.****COVENTRY AVIATION COY., 34a, EARL ST., COVENTRY.**  
Phone—92 Coventry. Wires—Coviation, Coventry.**CLABOUR-WESTBAY**

: FOR :

**2.B.A. Bolts—A.G.S. 103**Entire Output at present absorbed  
—by Government Requirements.—**W. A. Clabour, Westbay & Co.,**  
KIRKSTALL, LEEDS. Ltd.

Phone: Headingley 709.

Telegrams: Clabour, Kirkstall.

**Aluminium  
Castings**Sand or Die  
of every  
Description

2 H.P. to 600 H.P.

BEST METAL

GOOD CASTINGS

QUICK DELIVERIES

Contract L to  
H.M. Government**Chill Castings for  
Aeroplanes a Speciality**

Telephones: 3846 City.

Telegrams: 4379 Central.

Kirkstall, Leeds.

**R W COAN**

The Aluminium Foundry

219, COSWELL ROAD.

LONDON, E.C.





## TRADE CARDS.

## AEROPLANE TIMBER SPECIALISTS

**JOSEPH OWEN & SONS, Ltd.,**  
**Borough Saw Mills, LONDON, S.E.**

Telephone: HOP 8811 Telegrams: "BUCHERON, SEDIST,"

**Printing**

 Catalogues, Booklets, Leaflets, Showcards, etc., designed, written, illustrated and produced. Commonsense Ideas and Good Style at moderate cost.

GODBOLDS, 8, BREAMS BUILDINGS, E.C.4. 'Phone: City 5912

## JAMES NORTH HARDY &amp; SON, LTD.,

54, PORTLAND STREET, MANCHESTER,  
 MANUFACTURERS of all descriptions of COTTON and LINEN  
**WEBS, TAPES & TWINES FOR AIRCRAFT  
 AND ELECTRICAL WORK.**

London Branch: 3, FITCHETT'S COURT, NOBLE STREET, E.C.4.  
 Mills: HEATON PARK, nr. MANCHESTER.

Tel. Add.: "Hardson," Manchester Phone: No. 6471 Central

## FREDK. WARD

— FOR —

## Aero Engine and Gun Gear Parts

ALSO PATTERN AND JIGS.

**ALLSOP ST., UPPER BAKER ST., N.W.**

Phone: Paddington 4743.

## NAME PLATES.

WE SPECIALISE IN EVERY DESCRIPTION OF  
 NAME PLATES IN METAL, IVORINE, ETC.

**CLEGG METAL ENGRAVING CO.,**  
 CHATSWORTH WORKS, WORTHING.

## ALWIN ENGINEERING CO., AERONAUTICAL ENGINEERS,

LUTHER ROAD, TEDDINGTON, S.W.

Tel. No. Kensington 2412.

Makers of all kinds of Aircraft Fittings. Presswork  
 a Speciality. Pressings for DeH etc.  
 AVRO, SOPWITH, FAIREY and many other types.

On receipt of Post Card our Representative  
 will call and give immediate quotation.

## Springs! Springs! Springs!

We make a speciality of  
 Springs for Aeroplanes  
**SEND FOR PRICES.**

**Dart Spring Co., West Bromwich.**

## METRIC BOLTS &amp; NUTS (5 m/m to 8 m/m).

Stock Lists on Application.

## CASHMORE BROS.,

TELEPHONE: **Zota** HILDRETH ST.,  
 415 BATTERSEA **Works** BALHAM, S.W.

Screw-Cutting and Light Engineering. Accessories for Aircraft,  
 Electrical and Motor Trades. Brass and Iron Founders.

## TIMMS ENGINEERING WORKS

Makers of Jigs, Fixtures, and Special  
 Tools; also Aero Engine Components  
 and Gearing in quantities.

8a William St., West Kensington, W.14

## P.D.V. Aircraft Company, Ltd.

All Metal Parts for Aircraft made, comprising the  
 following machine work: **Milling, Turning,**  
**Shaping, Press Work, Slotting, Drilling, Grinding and**  
**Sheet Metal Work.** Well-equipped Welding and Brazing Plant.

Enquiries to **P.D.V. AIRCRAFT COMPANY, Ltd.,**

Offices & Works: **Princes Street, Richmond, Surrey.**  
 Telegrams: Asres, Richmond. Telephone: 1681 Richmond.

## Chauvière's famous Integral Propellers

HOLD ALL RECORDS; USED BY ALL  
 LEADING AVIATORS. THE BEST

Sole Proprietors for Great Britain and Colonies

**THE INTEGRAL PROPELLER CO., LTD.,**  
 Edgware Road, The Hyde, Hendon, N.W. 9.

Telephone—Kingsbury 104. Telegrams—"Aviprop, Hyde, London."

## EBORA PROPELLER COMPANY LTD

**Ebora**

## PROPELLERS

Contractors to the ADMIRALTY & WAR OFFICE

11 & 12 SURBITON PARK TERRACE, KINGSTON-ON-THAMES

Telephone: KINGSTON 672

Telegrams: "EBORA, KINGSTON"

**SCREW-DRIVING**  
**RUSSELL BROTHERS, Ltd., REDDITCH**  
**MACHINES.**

Trade **MENDINE** Mark.

## LIQUID SCOTCH GLUE

USED BY THE LEADING AEROPLANE CONSTRUCTORS.  
**MOISTURE PROOF.**

Write for Price List and Particulars

**MENDINE CO., 8, Arthur Street, London Bridge, E.C.**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



**HIDE GLUES****FOR AIRSCREWS AND  
AIRCRAFT CONSTRUCTION.**

— APPROVED BY H.M. ADMIRALTY AND A.I.D. —

**Manufacturers—Wm. OLDROYD & SONS, Ltd., 9, Mincing Lane, London, E.C.3.**

Telephone: 4978 Avenue.

**'FEARLESS' ENGINE CLEANING BRUSHES**As used by  
the R.F.C.Send Trade Card  
for  
**FREE SAMPLE.****FEARLESS BRUSH CO., LTD., 4, NORTHWOLD RD. LONDON N.16.****Auster**  
(1914) LTD**for AUSTER-TRIPLEX SHIELDS  
AERONAUTICAL ACCESSORIES****LONDON: 133, Long Acre, W.C.****BIRMINGHAM:****Crown Works, Barford Street.**Telephone: Regent 5910.  
Telegrams: "Winfector, London."Telephone: Midland 2123.  
Telegrams: "Auster, Birmingham."**CRADOCK'S STRANDS & CABLES**

Manufactured from Tinned Steel Wire of the Highest Quality.

CONTRACTORS TO HIS MAJESTY'S GOVERNMENT.

**GEO. CRADOCK & CO., Ltd., Head Office and Works: WAKEFIELD. London Office: 7, East India Avenue.****MISCELLANEOUS ADVERTISEMENTS.****AIRCRAFT PARTS.****Hardwood for Aeroplanes.**—Specially Selected air-dried timber as supplied to leading constructors in Britain and the Continent. Silver Spruce, Ash, Poplar; Hickory and Ash Skids; Three-ply; Thin Cedar and Mahogany for Floats; Walnut for Propellers.—William Mallinson and Sons, Ltd., Hackney Road. Phone, 3845 Central, 4770 Wall.**Tapes, Webs, Cords and Threads** in all qualities, suitable for Aircraft Work. Delivery from stock.—John MacLennan and Co., 30, Newgate Street, London, E.C.1. (See Advertisement Page iv of Cover and Buyers' Guide).**Aeroplane Seats** to any drawing or specification. Prompt deliveries.—F. C. Chappell, Cane Works, 9, Fisher Street, Nottingham.**Aeroplane Seats.** We can give quick delivery of cane seats, A.G.S. 264 or other patterns, guaranteed pass inspection. Write us for anything required in cane work.—The Willowbrook Company, Leicester.**Piercing and Blanking Dies** for aeroplane sheet metal parts. Quick deliveries, reasonable charges. Light punching work also undertaken.—The Remus Co., Ltd., Letchworth.**A.G.S. and Standard Perol Fittings** in G.M., petrol cocks, filters, fillers, etc., to B.P. engine and petrol details from the bar.—H. Burton and Co., Ltd., Cannon Works, Willesden, N.W.10.**TO LET.****To be Let** furnished, in Edgware, convenient for aircraft factory, Hendon, well-appointed house, containing 2 sitting rooms, 3 bedrooms, 1 dressing room, bathroom, kitchens, etc. Two and a-half guineas per week.—Reply, Box No. 3367, THE AEROPLANE, 166, Piccadilly, W.1.**WANTED.****Wanted Woodwork** for aeroplanes, very large up-to-date factory, fully equipped with latest machines; any class of aircraft work undertaken; prompt deliveries; best work.—Apply Box 3030, THE AEROPLANE, 166, Piccadilly, W.1.**Sheet Metal Works.**—Sub-contracts required for tanks, etc., by London firm.—Please address inquiries to Box No. 3366, THE AEROPLANE, 166, Piccadilly, W.1.**Wanted,** woodwork for aeroplanes, spares, ribs, etc. fret and band sawing, planing, etc.—Box 3362, THE AEROPLANE, 166, Piccadilly, W.1.**Aeroplane or other national work** wanted by a firm of pianoforte manufacturers, desirous of obtaining sub-contract for small woodwork parts (on approved list).—Apply, Box No. 3371, THE AEROPLANE, 166, Piccadilly, W.1.**Price for labour** assembling metal parts, Handley Page tail units, bending tubes, welding, soldering, rivetting, etc.—Box No. 3368, THE AEROPLANE, 166, Piccadilly, W.1.**To Propeller Makers.**—Sell your cuttings to B. Levy, 286, Hackney Road, Hackney. Good prices offered for mahogany, walnut, etc.**Wire and Cut Nails and Box Hooping,** or  $\frac{1}{2}$ -in. and  $\frac{3}{4}$ -in. thin strip iron. Large quantities wanted ex. stock, for cash.—"C." Box 125, Benson's, Kingsway Hall, W.C.2.**FOR SALE.****To Aeroplane Manufacturers** and others, Rochester. To be sold with immediate possession, valuable freehold premises, with ample buildings, including mill fitted 12 h.p. gas engine and all necessary woodworking machinery.—Full particulars of Messrs. Prall and Prall, Surveyors, Rochester, Kent.**Ireland.**—Seaport town, stone-built works, area 60,000 ft., one floor, water-power engine house and shaft, dynamo, railway siding, and canal. Site, six acres; lease, 38 years at £120. Price, £5,500.—Gordon and Co., 46, Old Bond Street, W.1.**For Sale.**—A number of secondhand aeroplane engines of the following types:—150 h.p. 8 cyl. Sunbeam, £60; 225 h.p. 12 cyl. Sunbeam, £80; 6 cyl. Beardmore, £100. To be seen at Car Mart, Ltd., 297, Euston Road, London. Telephone, Museum 2000.**MISCELLANEOUS.****Nerve Failure** speedily cured, self-consciousness eliminated, concentration increased, and confidence restored by sympathetic hypnotic suggestion. Interesting explanatory booklet post free.—Robert McAllan, Regent House, Regent Street, W.1.**MODELS.****Model Aeroplane,** flies  $\frac{1}{4}$  mile circular flight, carriage paid, 3s. 4d. "I can thoroughly recommend your machines." Testimonial from Dr. Adams, Union Road, Sheffield. Thousands satisfied, testimonials from all parts.—Dept. C., Bristol Model Aeroplane Depot, Eastville, Bristol.



## MISCELLANEOUS ADVERTISEMENTS.

**SPECIAL PREPAID RATE:** 18 words 1/6; Situations Wanted ONLY, 18 words 1/-; 1d. per word after. **TRADE ADVERTISEMENTS.** in these columns, 3 lines 3/-; 10d. per line after. Public Announcements, Legal Notices, Auctions, Contracts, etc., 16 per line. For the convenience of Advertisers, replies can be received at the offices of "THE AEROPLANE" 166, Piccadilly, 1st floor, W.1.

## PATENTS.

**PAGE & ROWLINSON**, Chartered Patent Agents (Consulting Engineer, Mr. S. E. Page, A.M.Inst.C.E.), 27, Chancery Lane, London, W.C. Tel. 332 Central.

**Henry Skerrett**, Chartered Patent Agent, 24, Temple Row, Birmingham.—Patents, trade marks, and designs.

## SITUATIONS VACANT.

**Wanted, Sheet Metal Workers**, fitters, and turner-fitters, must be first-class men. No one on Government work or residing more than ten miles away need apply to:—Harley Works, Beckton Road, Plaistow, E.16.

**First-class Assistant Draughtsman** required for aeroplane work. Good mechanical experience essential. No one on Government work need apply.—State experience and salary required to nearest Employment Exchange, mentioning this paper and No. 3327.

**A Large Aircraft Firm**, manufacturing machines of their own design, require the services of a number of really good mechanical draughtsmen who have had a thorough theoretical and practical training, as well as some experience, in aeroplane design and construction. Opportunities above the average exist for men to whom the above description applies. Applicants must live in London, and not be engaged on Government work, and they should write, stating age, past experience, and salary required, to Box No. 3354, THE AEROPLANE, 166, Piccadilly, W.1.

**Aviation Engine Manufacturers** in Midlands require immediately several good draughtsmen, essentially with experience in internal combustion engine design. No one on Government work need apply.—Apply, stating age, qualifications, and salary required, to your nearest Employment Exchange, mentioning this paper and No. A4661.

**Wanted** by an important aviation works near London, leading draughtsman and lady tracers. No one need apply who is now engaged on Government work.—All applications to be made at your nearest Employment Exchange, mentioning this paper and No. A4659.

**Wanted** capable assistant foreman to take charge of turners, machinists and fitters on night shift in aircraft factory. Improving position for the right man. Men on Government work need not apply.—Apply, stating fully, experience, age, and wages required, to your nearest Employment Exchange, mentioning this paper and No. A4655.

**A Large Firm**, London, N.W., has several vacancies for aeroplane erectors and assemblers, used to accurate and high-class aeroplane work. No one living more than 10 miles away or engaged on Government work need write to Box 3360, THE AEROPLANE, 166, Piccadilly, W.1.

**Required** at once, foreman for engineer's shop, one hour from London. Must be fully acquainted with production and employment of female labour. A really live man required. Good salary and conditions. No one on Government work will be engaged.—Applications must be made through nearest Employment Exchange, mentioning this paper and No. 3363.

**Aeroplane Makers** wanted, plane and fuselage assemblers and erectors; practical men of good experience as charge hands. Good wages to suitable men.—Reply, giving full experience, to Box 240, W. H. Smith and Son, Kingsway, W.C.2. No person residing more than 10 miles away or already engaged on Government work need apply.

**Required Planning and Progress Man** for aircraft factory, London district. Experienced man with good technical knowledge of aeroplane work. No person residing more than 10 miles away or already on Government work need apply.—Reply, stating particulars of experience and salary required to Box No. 3373, THE AEROPLANE, 166, Piccadilly, W.1.

**Lady Cost Clerks** required for aeroplane factory, London district. Preferably with aeroplane or engineering costing experience, and card systems. No person residing more than 10 miles away or already on Government work need apply.—Reply, stating age, particulars of qualifications, and salary required, to Box No. 3374, THE AEROPLANE, 166, Piccadilly, W.1.

## RADIATOR AND SHEET METAL WORK UNION WORKMEN (BEST RATES PAID) WANTED

No one already on Government work  
or resident more than ten miles away  
will be engaged.

Apply—

**GALLAY RADIATOR CO., LTD.**  
198, Gt. Portland Street, W.3

**Aeroplane Draughtsmen**.—Wanted by old established aeroplane manufacturers several first-class draughtsmen, with previous experience of aeronautical work preferred.—Apply, with full particulars of qualifications and salary required, to your nearest Employment Exchange, mentioning this paper and No. A4697. Men on Government work need not apply.

**First-class Draughtsmen** required for aeroplane work. Good opening for men with previous experience in aviation work. Those on Government work need not apply.—Write, stating particulars of experience and training and salary required, to your nearest Employment Exchange, mentioning this paper and No. 3372.

**Wanted Foreman** of erecting shop in flying boats factory. Must be thoroughly experienced and capable of efficiently controlling men and obtaining best results. No one on Government work will be engaged.—Apply, stating fully, experience, age, and wages required, to your nearest Employment Exchange, mentioning this paper and No. A4654.

## SITUATIONS WANTED.

**Position** as Superintendent or Foreman in erecting or fuselage department by smart man with up-to-date works method and organisation.—Box 3369, THE AEROPLANE, 166, Piccadilly, W.1.

**Works Manager**, disengaged, requires similar position in aircraft factory. Good practical man and splendid organiser. Moderate salary and commission on production.—Write, Box 3319, THE AEROPLANE, 166, Piccadilly, W.1.

**Works Manager**, or position of trust, 37, practical engineer, invaluable experience both aeroplanes and seaplanes. Tactful, energetic, methodical organiser, accustomed to latest service methods and capable of economically increasing production.—Box 3284, THE AEROPLANE, 166, Piccadilly, W.1.

**Works Manager** seeks position, or would superintend production; practical experience of seaplane and aeroplane sheet metal work and component parts. Good organiser. Tactful controller of labour. Latest methods of production. Capable of economically increasing output. Well recommended.—Box No. 3361, THE AEROPLANE, 166, Piccadilly, W.1.

**Chief Inspector**, 12 years' general engineering, two years on aero engines. Has held position of chief assistant six years, well up in A.I.D. requirements; good organiser, and used to quick repetition work. University training.—Box No. 3364, THE AEROPLANE, 166, Piccadilly, W.1.

**Storekeeper**, 30, 10 years motor, engineering, and aircraft industry; thoroughly experienced in all stores routine, progress, buying; accustomed to ordering from Blue prints; good organiser, tactful, well acquainted with the latest up-to-date methods, technical knowledge in aircraft production, correspondence, etc. Rejected from military service.—Box No. 3365, THE AEROPLANE, 166, Piccadilly, W.1.

**Advertiser** (39) requires responsible position. Ten years' engineering experience. Past two years with leading aero engine firm travelling country, placing contracts for engine parts, inspecting sub-contract works, rectifying and speeding up production. Needs no introduction to trade. Well known as buyer of materials, jigs, and tools, etc. Tactful, energetic, and methodical; executive ability.—Box No. 3370, THE AEROPLANE, 166, Piccadilly, W.1.

**Engineer** seeks berth as under manager or erecting shop superintendent. Ten years' aircraft experience of aeroplane and seaplane construction. Excellent references.—Box No. 3375, THE AEROPLANE, 166, Piccadilly, W.1.

## AVIATION

## AVIATION INSTRUCTION

on up-to-date lines, by a qualified Engineer in Aeronautics. Demonstrations from complete set of parts, and sectioned models.

Send for Prospectus No.1.A.,

**THE MOTOR TRAINING INSTITUTE  
LTD.,**

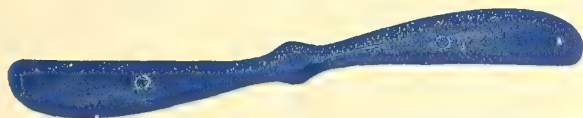
10, Haddon Street, Regent Street, W.1.

## ENGINEERING.

**British School of Aeronautics.**—Aircraft Engineering Course; Aero Design; Aero Construction; Aero Draughtsmanship; Mechanical Engineering.—Pennington's, 254, Oxford Road, Manchester.



## CHAUVIÈRE'S Integral Propellers



are used more extensively than  
any other Propeller in  
the World.

Hold all Records and are  
indisputably the best.

Maximum Efficiency.  
Best Workmanship.

**THE INTEGRAL PROPELLER CO., LTD.**

Edgware Road, The Hyde, Hendon, N.W.9.

Telegrams: "Aviprop, Hyde, London." Telephone Kingsbury 104.

## OXY- ACETYLENE WELDING & CUTTING PLANT

BLOW PIPES AND ALL WELDING ACCESSORIES  
CARBIDE. FLARELIGHTS. HANDLAMPS



PETROL AND OIL STORAGE TANKS OF ANY CAPACITY.  
STEEL BARRELS, SHEET METAL WORK FOR AIRCRAFT, &C.

**THE**  
**Acetylene Corporation Ltd.**  
**49 VICTORIA ST., WESTMINSTER.**

Telegrams:  
"Flamma, Vic, London "

Telephone:  
Victoria 4830.

ACCURACY



# J. H. ROBERTSON & CO

## AERONAUTICAL ENGINEERS

Tel. REGENT  
3996

LONDON OFFICE: 1, ALBEMARLE STREET. W.1

*All classes of machining.*

FINE LIMIT WORK.

JIGS, GAUGES, AND SPECIAL TOOLS.

TURNBUCKLES, EYEBOLTS A.G.S. SPECIFICATION.

STAMPINGS, AND HIGH-CLASS STEEL FORGINGS,  
PRESS WORK, &c.

OVERHAULING AND REPAIRS TO ALL TYPES OF  
AERO MOTORS.

PROPELLERS FOR ALL TYPES OF AIRCRAFT.

CRANKSHAFTS, PISTONS, GUDGEON PINS, VALVES A SPECIALITY.



# THE GREEN ENGINE CO., LTD.



:: CONTRACTORS TO ::  
H.M. ADMIRALTY  
AND WAR OFFICE.

## 166, PICCADILLY, W.1.

Telegrams: "Airengine, London"

Telephones: Gerrara 8165; Richmond 1293.

Telephone: City 3115. ESTABLISHED 1875 Telegrams: "Vanduaara Cent. London."

### TAPES, WEBS, CORDS & THREADS

*for Aircraft  
Electrical & Munition Work.*  
Delivery from Stock.



### JOHN MACLENNAN & CO

30 NEWGATE ST LONDON E.C.1.  
AND AT GLASGOW.

Contractors to H.M. Government.

EDITORIAL AND ADVERTISEMENT OFFICES, 166, PICCADILLY, W.1.

Printed for THE AEROPLANE AND GENERAL PUBLISHING CO., LTD., by BONNER & CO., The Chancery Lane Press, Rolls Passage, London; and Published by THE ROLLS HOUSE PUBLISHING COMPANY, LTD., at Rolls House, Brems Buildings, London.



# THE AEROPLANE

WEDNESDAY, FEB. 27. 1918.

Edited by C. G. G. G.

Vol. XIV. No. 9

THREEPENCE WEEKLY

Registered at the G.P.O.  
as a Newspaper.

## THE NORMAN THOMPSON FLIGHT CO. Ltd.

ESTABLISHED 1909

Telegrams—SOARING, BOGNOR  
ENTIFLYTE CHARLES, LONDON

Works—MIDDLETON, BOGNOR

CONTRACTORS TO THE ADMIRALTY

Telephones—BOGNOR 48. GERRARD 7385

London Office—  
DEWAR HOUSE, 11, HAYMARKET, S.W.1.

DESIGNERS AND MANUFACTURERS OF FLYING BOATS AND LAND PLANES

**Auster** FOR **Aero-shields**  
LONDON. BIRMINGHAM

**BEARDMORE** AERO  
ENGINES

**TITANINE**  
NON-POISONOUS  
**DOPE**  
SEE ADVERT. INSIDE.

**ACCLES & POLLOCK, LIMITED**

WELDLESS STEEL TUBES — OLDBURY, BIRMINGHAM.

SEE ADVERT. INSIDE.

**TRIPLEX** Safety **GLASS**  
See Advt. inside.



# THE ENGINEERING TIMBER CO. Ltd.

11, Victoria Street, London, S.W.

J. E. HUSON, Managing Director.

Telephone: Victoria—5073, 4210

Telegrams: Entikosil, Vic. London.

**SILVER SPRUCE**

**ASH**

**WEST VIRGINIAN SPRUCE**

**WALNUT**

**MAHOGANY**

**GLASGOW:**

**67, HOPE STREET.**

Telephone: Central 3273.

Telegraphic Address: Entikosil, Glasgow.

**PARIS AGENCY:**

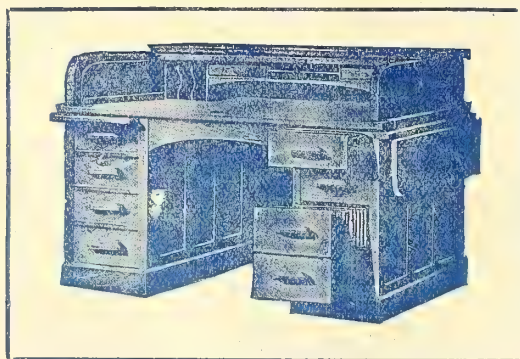
**6, RUE DE HAVRE, PARIS.**

## Factory & Office Furniture

LARGEST STOCK FOR **IMMEDIATE** DELIVERY.

(NEW AND SECOND-HAND)

SPECIALITÉ



SAFES.

## COOKE'S (FINSBURY) LTD.

INCORPORATING

The FINSBURY OFFICE  
FURNISHING Coy.

&

J. W. COOKE  
& Coy.

FINSBURY PAVEMENT HOUSE, LONDON, E.C.2.

Telephones: LONDON WALL } 6179.  
573.

See Telephone Book relating to our Shopfitting, Signs and other Departments.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# EMALLITE

NON-POISONOUS

AEROPLANE DOPE.

THE ORIGINAL AND STILL THE PREMIER.

AS  
TIGHT



Trade Mark.

AS  
A DRUM.

THE BRITISH EMALLITE CO., LTD.,

Contractors to the Air Board.

Registered Offices:

30, Regent Street, Piccadilly, S.W.1.

Wire—"Ridleyppren, Piccy, London."

" Phone—280 Gerrard

Works

5, Hythe Road, Cumberland Park,  
Willesden Junction, N.W.10.

Telephone—Willesden 2346 & 2347.

Metal  
Fittings  
a  
Speciality.

**The Aero Mechanical Co., Ltd.**

CONTRACTORS TO THE AIR BOARD.

60-66, ROCHESTER ROW, LONDON, S.W.1.

Managing Directors:  
E. Salomon, J. Fogelson

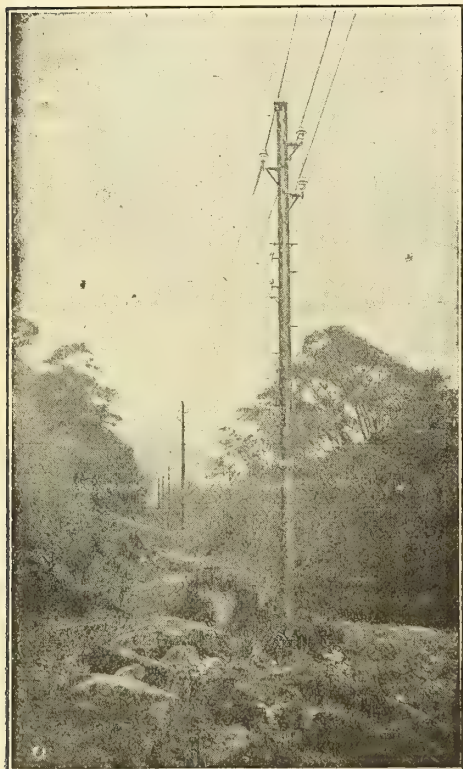
Telephone:  
Vic. 7570 (3 lines).

Complete Fittings  
and Dies in Stock for  
latest D.H. Machines;  
also most of the Fittings  
for other D.H. Machines  
and Handley-Page.

Our reputation has been built up by our ability to effect  
deliveries right up to time.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





SPECIALISTS IN ELECTRICAL TRANSMISSION AND DISTRIBUTION



CABLES

OVERHEAD LINES

SWITCHGEAR

TRANSFORMERS ETC

*The Illustration shows a section of a 20,000 volt three-phase overhead*

## ELECTRIC POWER TRANSMISSION LINE

*lately completed by us for an outlying Government Mine.*

*The cheapest method of delivering power to Works, etc., in country districts.*

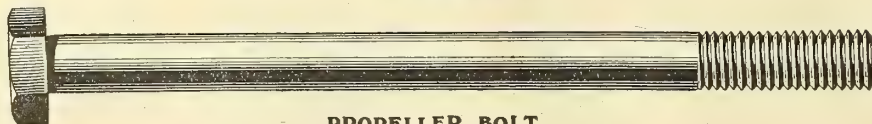
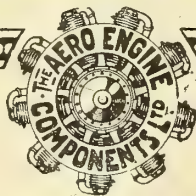
12, UNION COURT, OLD BROAD ST., LONDON, E. C. 2.

**JOHNSON AND PHILLIPS LTD**  
ELECTRICAL ENGINEERS & CABLE MAKERS  
**CHARLTON, LONDON, S.E. 7.**

Telegram  
"Juno"  
LONDON

Telephone  
400  
GREENWICH

BIRMINGHAM CARDIFF GLASGOW MANCHESTER NEWCASTLE-ON-TYNE PORTSMOUTH  
208, Corporation St. 9, Park Place. 159, W. George St. 251, Deansgate. 44a, Blackett St. Cleveland Rd. Gosport



PROPELLER BOLT

**OUR** works are equipped with all the most modern and up-to-date machinery for the economical manufacture of Engine Parts. We can undertake your requirements. Let us hear from you.

**The Aero Engine Components Company,**  
39, ST. JAMES'S STREET, LONDON, S.W.1.

Telegrams

407 and 408 Regent.



# THE BRITISH WRIGHT CO. LTD.

Owners of the British, Italian and Belgian Patents  
of Wilbur and Orville Wright.

Manufacturers of  
**AERONAUTICAL  
INSTRUMENTS**  
FOR  
NAVY & ARMY AEROPLANES

Ogilvie Air Speed Indicators  
for use on Aeroplanes, Airships, Biplanes  
Balloons and Air Stations.

Statoscopes.

Recording Manometers.

Wind Speed Recorders.

At present the Government is taking the entire output, but  
British and Foreign firms are invited to place their orders  
now for delivery of Aeronautical Instruments after the War.

**The BRITISH WRIGHT Co. Ltd.**  
55, CHANCERY LANE, LONDON, W.C.2.

## Alardux

Alardux is the New Aluminium Flux

A Welding Flux of exceptional merit

May we send you a sample?

The Alardux Co.,  
23, Fleet Street,  
London, E.C.4.

City 866.

# B·G·L

METAL COMPONENTS  
FOR  
AIRCRAFT



Tool Making and  
Experimental Work

WE ARE IN A POSITION  
TO ACCEPT ORDERS  
:: FOR THE ABOVE ::

THE BIRMINGHAM GUILD LTD  
GT. CHARLES STREET, BIRMINGHAM.

KINDLY MENTION "THE AEROPLANE"

## CHAUVIÈRE'S Integral Propellers



are used more extensively than  
any other Propeller in  
the World.

Hold all Records and are  
indisputably the best.

Maximum Efficiency.  
Best Workmanship.

THE INTEGRAL PROPELLER CO., LTD.  
Edgware Road, The Hyde, Hendon, N.W.9.  
Telegrams: "Aviprop, Hyde, London." Telephone Kingsbury 104.

WHEN CORRESPONDING WITH ADVERTISERS.



**R. F. & F. W. BROWN**

(F. W. BROWN.)

Wollaton Saw Mills  
Near Nottingham**ENGLISH ASH FOR AEROPLANES**  
**Bent Timber Manufacturers.**

Telephone .. 1526 Nottingham.

Telegrams .. Browns, Sawmills, Wollaton.

**A.G.S. WASHERS**Wire  
Work.**THIMBLES**Turn Buttons.  
Eyelets.  
Washers.**UNION NUTS & NIPPLES.**Tel.: 550 Central  
Tel. Ad.: BRISK, BHAM.**W. H. BRISCOE & Co., Ltd.,**  
51, 52, 53, PARK STREET,  
BIRMINGHAM.**"NOVELLON" DOPE**  
**AND AEROPLANE VARNISH.**  
CELLULOSE ACETATE & CHEMICALS**BRITISH CELLULOSE & CHEMICAL MANF'G.**  
COMPANY, LIMITED.Telegrams :  
Cellutate, London. 8, WATERLOO PLACE, S.W.1. 'Phone: Regent 4045.Works: Spondon, Derby; and Maybury Gardens, High Road, Willesden Green, N.W.10.  
(Telephone: Willesden 2380.)**THE AIRCRAFT CONSTRUCTION CO.**

EVERY DESCRIPTION OF METAL COMPONENTS.

**Immediate Delivery of SE SUMPS.****HARLEY AEROPLANE WORKS, Beckton Rd., E. 16**

Telegrams: "Aercracons," Canning, London.

'Phone: East 1300.



# PROPELLERS ONLY.



**CONTRACTORS TO  
H.M. GOVERNMENT**



Office & Works—  
Propeller Works,  
Balm Road,  
Hunslet,  
Leeds.

Telephone—  
Central 291.  
Telegrams—  
Aircscrews, Leeds.

Telegraphic Address: POETRY, 'PHONE LONDON.  
Telephones: AVENUE 995, 996, 7996.

(Partners:  
H. W. PRITT,  
W. G. PRITT,  
P. W. SMALLWOOD,  
E. R. HILL),

## PRITT & CO.

METAL WAREHOUSEMEN, MUNITION  
AND AERONAUTICAL CONTRACTORS

46, FENCHURCH STREET,  
LONDON, E.C. 3,

Where all communications must be addressed.

CITY WAREHOUSES: 62a, Vine Street, Minories, E.  
9, Jewry Street, Aldgate, E.C.  
DEPOTS: Paddington, Poplar, Shoreditch.

We hold good stocks, complying with Air Board, R.A.F.  
and Admiralty Specifications, of the following:

BRASS & COPPER in sheets, tubes, rod, wire, etc.  
TINNED STEEL SHEETS.  
MILD STEEL SHEETS, 9a.  
BRIGHT DRAWN MILD STEEL BARS, 3a.  
A. G. S. BOLTS, NUTS AND WASHERS.  
COPPER RIVETS. TINMAN'S SOLDER.  
SOLDERING IRONS.  
BEST SWEDISH WELDING WIRE.  
BRAZING SOLDER in wire and granulated form.  
SILVER SOLDER. WIRE GAUZE, &c.

All material passed A.I.D. before despatch.

DAILY DELIVERIES made by our own vans within a radius of  
15 miles of our Warehouses.

NOTE.—All orders for Aeronautical Work receive especially  
prompt attention.

WE ARE BUYERS OF SCRAP BRASS & COPPER.

CONTRACTORS TO H.M. GOVERNMENT

## W.T. CLARK & CO.

Telephone  
No.  
Central  
2121.

5, GREEN TERRACE,  
ROSEBERY AVENUE,  
LONDON, E.C.1.

Telegrams  
Etalspinne  
Isling London.  
Two Words

## METAL SPINNERS and SHEET METAL WORKERS

for Aeroplane Constructors

METAL SPINNINGS for AEROPLANES

Cowlings (COMPLETE SET)  
Coverings  
Undershields

Fairings  
Petrol Tanks  
Shields etc.

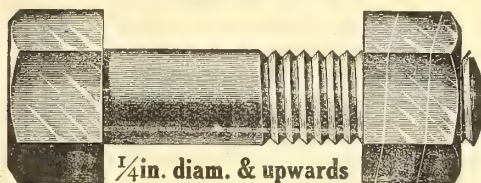


BEATEN COWLS  
OF EVERY  
DESCRIPTION

SPUN COWLS  
UP TO  
48 INCHES  
IN DIAMETER.



## BRIGHT BOLTS & NUTS



(Suitable for Every Description of Engineering Work)

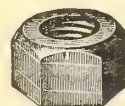
QUALITY, ACCURACY AND FINISH GUARANTEED

## THE "HELICOID" LOCK-NUT

(THE FINEST LOCK-NUT IN THE WORLD.)

This nut will remain secure, no matter how great  
the vibration may be—in fact vibration actually  
tightens the grip.

(made from 1/4 in.  
to 2 1/2 in.)



(sample nut & prices  
on application)

We also manufacture Wrought Iron Railing and Gates, etc.

**BAYLISS, JONES & BAYLISS,**  
LTD.

WOLVERHAMPTON.

London Offices: 139/141, CANNON ST., E.C.4.



# Bowden

**BOWDEN  
CONTROLS  
AND  
BOWDEN CABLES  
FOR ALL  
AEROPLANE  
PURPOSES.**

Quotations on application.

Not: Address—

**The BOWDEN BRAKE  
Co., Ltd., Tyseley,  
B'HAM.**



# Tyseley

R.H.S.

## AIRCRAFT DEPARTMENT



THE WORLD'S LARGEST MANUFACTURERS OF ALL KINDS OF ENGRAVED METAL GOODS

### British Metal (Kingston) Ltd.

*The Factory,*

Kingston-on-Thames.

**DIALS & INSTRUCTION PLATES  
MADE IN ANY METALS,  
IVORY, IVOROID, BONE, ETC.  
ANY QUANTITIES, WORDING, DESIGN,  
SIZE, SHAPE OR COLOURS.**

**COMPLETE SHEET METAL  
AIRCRAFT COMPONENTS**

RIVETED, SWEATED, BRAZED OR WELDED.

R.E., F.E., B. & D, B.E., C-D-E,  
SE, DE H.

RESIDENT A.I.D. EXAMINER.

## Aircraft Fittings.

### GABRIEL & CO.

*Manufacturers of  
AEROPLANE FITTINGS in BRASS,  
COPPER, GUN METAL, BRONZE  
AND GLARUS ALUMINIUM.*

Castings supplied either Machined complete  
or in the rough.

Sheet Metal Work in Brass, Copper, Steel,  
Tin, or Aluminium, including Spinings,  
Stampings and Pressings.

**A.G.S. FLANGES, PETROL FILTERS, ETC.**

Tube Bending and Capstan Work a speciality.

*Contractors to Admiralty, War Office,  
Ministry of Munitions, H.M. Air Board,  
Royal Aircraft Factory and Crown  
Agents for the Colonies.*

TEL. ADDRESS:  
GABRIEL, BIRMINGHAM

TELEPHONE:  
CENTRAL 1223.

**4 & 5, A. B. ROW,  
BIRMINGHAM**

Contractors to H.M. Government.

# SWIFT AVIATION CO.

**Dolphin Engine Plates in Stock,  
Complete Sets.**

*Speciality Sopwith Spares.*

# KINGSTON

PHONE—  
762 KINGSTON

'GRAMS—  
"SWIFT, KINGSTON"



# SHENSTONE & CO., AIRCRAFT DEPT., GRANGE ROAD, LEYTON.

Owing to our constantly increasing output we have vacancies for First Class Hands in the following Departments.

**MALE** **WOODWORKERS.**  
**PATTERN MAKERS.**  
**CARPENTERS & JOINERS.**  
**SPINDLE HANDS.**  
**JIG MAKERS.**

**FEMALE** **COVERING.**  
**RIB MAKING.**  
**SEWING.**  
**VARNISHING.**  
**DOPING.**

General Manager—E. KEITH DAVIES.

Telephone—Walthamstow 24.

Registered Trade Mark.



Non-Inflammable Transparent Celluloid.

**LONDON LABEL CO., Ltd.,**

Contractors to H.M. Government.

HARLEY WORKS, BECKTON RD., LONDON, E.

**WIND SHIELDS**  
**MAP COVERS**  
**OBSERVATION PANELS**  
*Prompt deliveries of every type.*  
**LUMINOUS PRINTING**

Labels for Instrument boards, &c., for night work.

Any special article made up to templates or drawings and delivered by return.

**N.B.**—Nonflamoid is very much lighter and easier to work than any kind of glass, also it will stand much harder usage.

Telephones:

Gosport 217.

Southampton 1861.

London: Gerrard 5716

Telegrams:

"Flight, Gosport."

"Flying,  
Southampton."

## GOSPORT AIRCRAFT CO.

(Under Government Control—Munitions of War Act, 1915).

HEAD OFFICE: GOSPORT.

WORKS: GOSPORT & SOUTHAMPTON.

Sir Charles Allom.

Charles E. Nicholson.

London Office: 15, George  
Street, Hanover Square, W.1.

Are YOU interested in Flying? If so, why are YOU not taking

## The Nottingham Flying and Correspondence Schools, Ltd., Course?

The Imperial Flying Service Pilots say it is the Best in the Country.

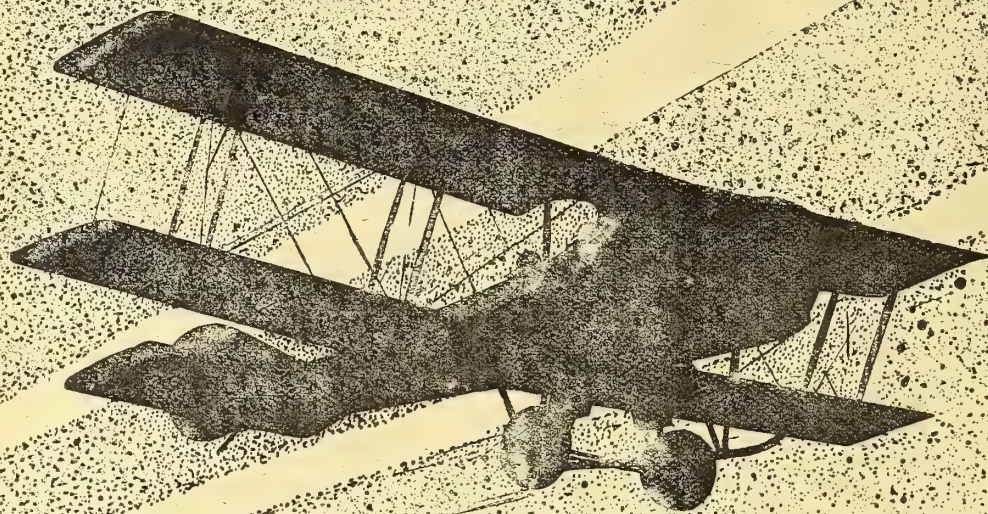
Write for Particulars and Illustrated Book issued Free.

**CASTLE MEADOW ROAD, NOTTINGHAM.**

'Phone 5766.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





# AVRO

## NOTHING BETTER

### AVROE & CO. LTD.

TELEGRAMS  
TRIPLANE.

MANCHESTER

TELEPHONE  
CITY 8530 &  
8531



# The AEROPLANE

The Editorial and Advertising Offices of "The Aeroplane" are at 166, Piccadilly, London W.1.  
 Telegraphic Address: "Aileron, London." Telephone: Mayfair, 5407.  
 Accounts, and all correspondence relating thereto, should be sent to the Registered Offices of  
 The Aeroplane and General Publishing Co., Ltd., Rolls House, Breems Buildings, E.C.4.  
 Subscription Rates, post free: Home, 3 months, 3s. 10d. 6 months, 7s. 7d.; 12 months, 15s. 2d.  
 Foreign, 3 months, 5s. 0d.; 6 months, 10s. 0d.; 12 months, 20s. 0d. Canada, 1 Year, \$4.70c.  
 U.S.A.: 1 Year, \$5.20c.

## ON THE AIR FORCE ESTIMATES.

When one comes to consider the way in which politicians have handled the affairs of the Flying Services, one is upheld against the mental depression which such consideration produces by the knowledge that the new Air Force is in fact controlled by a soldier who knows what the Army needs and intends that the Army shall have it, and that the production of aircraft is in the hands of an engineer who, equally, is resolved to give the Army what it wants.

Thus one has complete confidence in the future of Service aviation, despite the hindrances of political intrigue and influence. One regrets that the work of the soldier and of the engineer should be thus hampered, and that between them they should not have full power to do precisely as they please without reference to anybody else. But both are men who are used to having their own way, and to overcoming apparently insuperable obstacles, so that there can be no doubt as to their ultimate success.

The dominant position of the R.F.C. in France and in other war areas to-day proves what they have done during the past year, and it seems unlikely that, even under the new Air Force scheme, they will have to face greater difficulties than those which they have overcome in the past.

Therefore it should be clearly understood that whatever criticisms follow hereafter are directed purely against the political people and in no way against the Services nor against those who are doing their best to provide the aircraft which the Services require.

The following report of the proceedings in the House of Commons on February 21st is taken verbatim from the official report of the proceedings, commonly known as "Hansard." Much has been deleted, owing to the customary verbosity of the political breed, but considerable effort has been made to retain every point of importance:—

### THE AIR FORCE ESTIMATES.

The Estimates, introduced by Major Baird, Under Secretary of State to the Air Ministry, were set forth in "token" form, merely £1,000 for this, that, or the other purpose. Major Baird, who, contrary to established custom, read his speech from typed sheets, was needlessly prolix, and much of his matter was better suited to a Pleasant Sunday Afternoon lecture on "Our Gallant Airmen" than to a serious exposition of the internal economy of the Air Force, and the fate of the two Flying Services. However, after the deletion of most of the verbiage, the salient points are as follows. When comments have seemed advisable they appear in brackets:—

**The Under Secretary of State to the Air Ministry (Major Baird)** said: Since the passing of the Air Force Act the ground has been explored by a strong Inter-Departmental Committee under the chairmanship of General Smuts, and matters were advanced sufficiently to enable the Air Council provided by the Act to be set up by an Order in Council of December 21st last. [What has General Smuts to do with the Air Force?]

Since that date the organisation of the Ministry has proceeded satisfactorily. A Central Branch, or Secretariat, has been organised, a Finance Branch has been organised, and a General Branch of Statistics is in progress of formation. Establishments for the Service directorates and their staffs have been prepared,

and practically all outstanding questions as regards pay and conditions of service under the new Air Force have been decided. A Works and Buildings Department has been organised, and arrangements have been made whereby the Director-General of Lands for the War Office and the Ministry of Munitions is to perform, and is now performing, similar functions in respect of lands for the Air Ministry.

By February 1st the organisation was sufficiently advanced to enable the Air Ministry to enter into conferences with the War Office and the Admiralty on the subject of the detailed arrangement for the actual transfer of the Royal Naval Air Service and the Royal Flying Corps. It was agreed that the transfer should take place gradually.

If things go on as they are at present, I hope that early in the next financial year it may be possible to constitute the Air Force at home and to start the machinery going. [One gathers that the said Financial Year begins on April 1st.]

### DUTIES OF THE COUNCIL.

Hon. members perhaps will desire to know the distribution of the duties among the members of the Council. . . . The Chief of the Air Staff is charged with advising His Majesty's Government as to the conduct of air operations in all questions of air policy affecting the security of the Empire, including home defence. He is further charged with liaison with the Allies, with the Admiralty, and with the Army Council as regards policy, operations, and intelligence. Under his Department falls the subject of policy as to air organisations and establishments. The principles of training are laid down by him. Schemes of development of the Air Force are also settled by him. Guidance as to the specifications of aircraft, engines, armament, ammunition, and other equipment, strategic and tactical dispositions of air stations, and general schemes for works and aerodromes—that covers, briefly, the sphere assigned to the Chief of the Air Staff.

[And, happily, we have the best possible man for the job.]

The Master-General of Personnel corresponds generally to the Adjutant-General on the Army Council. He is charged with the duties of raising the personnel of the Air Force, with its maintenance, both in officers and men, with the selection of candidates for commissions, and with the posting of officers and men to the units to which they belong. Discipline and all legal questions connected therewith fall within his sphere as well as the arrangements for the Medical and Sanitary Services.

The Controller-General of Equipment combines the functions of the Master-General of Ordnance and the Quartermaster-General on the Army Council. He is charged with the supervision of the provision of aircraft, engines, armament, ammunition, and other equipment in accordance with the schemes and guidance as to specifications of the Department of the Chief of the Air Staff, and the arrangements with the Director-General of Aircraft Production for the production of these stores, and for experiment and research to improve the designs and supply of all such equipment.

The Director of Lands is charged with taking over, whether by agreement or under the Defence of the Realm powers, all land required by the Ministry, and the management and maintenance from an estate point of view, and subject to the requirements of the Air Service, of all lands taken over, exclusive of any constructional work. All constructional work falls within the province of the Administrator of Works and Buildings. I may say that we have taken over *en bloc* the works and lands held by the Army Council and the Admiralty respectively in connection with the Royal Flying Corps and the Royal Naval Air Service.

The duties of the Parliamentary Under Secretary of State combine, *mutatis mutandis*, the functions of the Parliamentary Under Secretary of State for War and the Financial Secretary to the War Office.

The duties of the Secretary to the Air Council comprise the general control and co-ordination of Air Ministry procedure and of the conduct of official business in the Air Ministry.



## CO-OPERATION WITH THE SENIOR SERVICES.

For securing co-operation and co-ordination with the Admiralty and the War Office, the position is as follows:—The Admiralty and the War Office respectively submit their requirements to the Air Ministry for aircraft. The Air Staff examines these requirements, and either agrees, disagrees, or modifies, as the case may be, and decides, subject to War Office or Admiralty agreement.

A conference is held weekly to discuss these points between the Staffs of the Admiralty, the War Office, and the Air Ministry, and the question whether a particular Air Force should be under the Army or the Navy for administration and operations is discussed, and recommendations are made at this meeting. The Air Council also has the power of laying down and recommending to the War Cabinet certain aerial operations, such as bombing, and the best means of carrying out those operations are discussed, and whether the Army should carry them out or the Navy should carry them out. The machines are specifically earmarked for these operations, and organised for this work. That is briefly the essential distribution of work among members of the Air Council.

## THE MEDICAL SERVICE OF THE AIR FORCE.

A very strong and representative Committee, under my hon. friend the member for Edinburgh University (Sir Watson Cheyne), at the request of the Air Board, drew up a scheme for a Medical Service for the Air Force. It was necessary that the assent of the Army and Navy should be obtained to the adoption of any scheme connected with the change, and though I do not think any objection was felt by the Army or the Navy to the vast majority of the proposals which were submitted by this Committee, I fancy the Army felt that the setting up at this moment of a fresh and altogether separate Medical Service might lead to friction and trouble. I may safely say that we have come to an arrangement which meets the views of the Navy and the Army, under which it will be possible to carry into effect the system advocated by the Committee.

It is absolutely indispensable that the medical officers responsible for the care of the officers and men serving in the air should specialise in that particular branch of medical science, and that they should not be shifted and changed indiscriminately from one place to another. [Which is, presumably, why the Admiralty removed the first Naval doctor who ever specialised on the physiology and psychology of aviators, and sent him to work on a battleship.]

It has been agreed by the War Office and the Admiralty, and assented to by the Treasury, that the medical affairs of the Air Force are to be controlled by a Committee responsible to the Air Council. The Committee is to be composed as follows: The Director-General of the Naval Service, the Director-General of the Army Medical Service, the Vice-President of the Air Council, a Medical Administrator of the Air Force, an Assistant Medical Administrator, one neurologist, one physician, one surgeon, one physiologist, and the Secretary of the Medical Research Committee. The Assistant Medical Administrator will act as Secretary.

The Administrative Medical Officer will be given the substantive rank of Surgeon-General, and the Assistant Administrative Officer will be given the substantive rank of Lieutenant-Colonel. The Medical Administrator will nominate an executive staff of medical officers, and will arrange for the necessary clerical assistance. It will be necessary for the Medical Administrator to have discretion to take action on any matter of urgency and on matters of detail which arise in the intervals between the meetings of the Committee. Such action will, of course, be reported to the Committee.

As soon as possible the medical arrangements of the Air Force will be centralised under the direction of the Committee. All medical appointments will be made by the President of the Air Council on the nomination of the Committee. Officers who are appointed to the Air Force medical posts will be seconded to that Force. Temporary Air Force Commissions will be given to all gentlemen, whether officers or not, who are appointed to executive medical posts, with the exception of a limited number of officers to be nominated by the Committee for permanent commissions. All medical officers appointed to the Air Force will wear Air Force uniform. Those officers who are seconded from the Army and Navy will receive an assurance in writing that their prospects of promotion by selection in their own Services will not be prejudiced thereby. [Which is not much help.]

The Administrator of the Medical Service will have direct access to the Secretary of State for the Air Force, and the medical arrangements of the Air Force will be dealt with in the Department of the Master-General of Personnel.

## THE ADVISORY COMMITTEE.

The Advisory Committee for Aeronautics was appointed in April, 1909, under the presidency of Lord Rayleigh, "to advise the Government on matters connected with flight, whether of aeroplanes or dirigibles." The work of the Committee is primarily research. The expenses incurred in connection with it fell on the Air Board vote. This position remains unchanged

since the establishment of the Air Council and the Committee is under the control of the Council, reporting to the Director-General of Aircraft Production as one of its members. Lord Rayleigh remains the President of the Committee, and its Chairman is Sir Richard Glazebrook, and its very distinguished membership is constantly changed, that is to say, additions are made with a view to keeping them thoroughly up-to-date and in touch with flying conditions. [There might be several subtractions with advantage.]

Closely connected with the Advisory Committee on Aeronautics is the Air Inventions Committee. This Committee was established when Lord Trowbridge was President of the Air Board largely at his instigation. Its function is to unify the functions of the aeronautical sections of the Board of Inventions and Research, and the Munitions Inventions Department. The Inventions Committee is in form a Sub-Committee of the Committee for Aeronautics, from which its members are largely drawn, and to which it reports at the same time as to the Air Council. The Chairman is Mr. Horace Darwin, and it comprises many other distinguished scientific gentlemen. There is an Engine Sub-Committee, an Aeronautics Sub-Committee, an Armament Bomb Sub-Committee, an Instruments Sub-Committee, and a Procedure Sub-Committee, and, speaking from memory, I think in their last report they said they had examined over 1,100 inventions in the course of last month. The object, of course, is to ensure that inventors shall be given a fair chance. [One doubts whether the Committee has sufficient practical experience of flying or of war to ensure this.]

## THE TECHNICAL DEPARTMENT.

A very important change which has been made by the Air Council is the transfer of the control of the Technical Department of the Air Board to the Department of the Director-General of Aircraft Production of the Ministry of Munitions.

It was thought when the second Air Board was formed and the Technical Department was put under its control in December last, that that arrangement would best meet the object in view. There was reason for thinking that, because the heads of both branches of the Air Service and the Controller of Aeronautical Supplies were all members of the Air Board, a technical department working directly under the Air Board would be in the closest possible touch with the users, represented by the heads of the two Services on the one side, and the producers, represented by the Controller of Aeronautical Supplies, on the other side. But experience showed that in a supply of so varied and highly technical a character as that furnished by the Aircraft Production Department there were disadvantages in separating supply from design.

I should like to express emphatically the sincere appreciation which the old Air Board felt for the zeal and efficiency of the officers constituting the Technical Department under its orders. Most of those officers have been transferred to the new Technical Department which has been set up under the orders of the Director-General of Aircraft Production. Under the new system it is hoped to secure the same close touch between the Technical Department and the users of the machines, while doing away with a gap which was found to be inevitable between those responsible for design and those responsible for production so long as the Designs Department and the Supplies Department were not united under the same head. [As a matter of principle the new system is wrong. The Technical Department ought, for the health of the Service, to be opposed to and in competition with the Supply Department, otherwise its activities are likely to be hampered by the demand for standardisation.]

The experimental stations of the Royal Naval Air Service and the Royal Flying Corps have also been transferred to the Technical Department serving under the Controller-General of Aircraft Production, who also has complete control of the Royal Aircraft Factory.

## RELATIONS WITH THE MINISTRY OF MUNITIONS.

The relations between the Air Ministry and the Ministry of Munitions are, indeed, now technically the same as those between the War Office and the Ministry of Munitions, with the very important difference that the Director-General of Aircraft Production is a member of the Air Council and consequently in close touch not only with the Controller-General of Equipment, but also with the Chief of the Staff and the Secretary of State. The maintenance of the closest possible relations between the producer and the user of aircraft is thus assured. It would be possible to enormously increase the output of machines probably if you were content to accept large numbers of standardised out-of-date machines, and it would be equally possible to dislocate the whole of your supply arrangements if you are for ever altering your type of machines in deference to certain demands from the front. Obviously if a machine comes out at the front slightly better than another machine which does its work most efficiently, no one will have anything to say to the old machine and everyone will insist on having the new one. You have to hold the balance between those two views,



and we hope that in the arrangement which is now being made, and in virtue of the personal relations which exist between all members of the Council, we have secured that object. [On the whole the general scheme might have been very much worse, but no case has yet been made out for taking the R.N.A.S. away from the Navy and the R.F.C. away from the Army.]

[Here Major Baird, who had been talking for about an hour, wandered off into a dissertation on the work of the active service aviator, whom he called "the boy in the aeroplane at his post high up in the skies." The following is a sample:—] The work performed by fighting squadrons is the work which was described by the Prime Minister, with truth and eloquence, as that of the Cavalry of the Air. It is glorious and invaluable work. They keep up a constant offensive against enemy machines in order to protect our machines from destruction. They ceaselessly scour the sky in search of enemy fighters whose task is to prevent our artillery ranging and photographic machines from carrying out their duties. They form a screen, behind which the other machines in the air carry out their work. The man in command of a fighting machine has his eye constantly fixed in the air in search of enemy aircraft—

**Mr. Billing:** Is it in order to continue this lecture without lantern slides?

**Mr. Speaker:** If the hon. Member cannot behave himself, I shall call upon him to withdraw altogether.

**Major Baird:** I am endeavouring to describe the different phases of activity designedly, because I wish hon. Members to understand how multifarious and varied are the duties which have to be discharged by our men in the air. [In the course of the rest of his dissertation he gave a few figures which are of interest. They were as follows:—]

In September last year 139 enemy machines were definitely ascertained to have been destroyed by our aeroplanes, 13 others were destroyed by anti-aircraft gunfire, and 122 more were shot down out of control.

On one day on the Western Front last year 127 hostile batteries were successfully engaged for destruction with aeroplane observation. Some 28 gun pits were destroyed, 80 more were damaged, and 60 explosions of ammunition were caused.

On the same day 34 hostile batteries were successfully engaged for destruction with balloon observation. Being engaged for destruction, means that a battery is ranged onto a target and it continues to fire onto that target until the target battery is no longer operative.

In the month of September last, on the Western Front, 15,837 photographs were taken in the air.

Last September, excluding Italy, 7,886 bombs were dropped on the Western Front, and in the following month 5,113.

The weight of bombs dropped was 238 tons in two months.

A great deal of useful work is done by attacking troops from the air. In December 123,000 rounds were expended in this manner, and in January 209,000. [Allowing a rate of fire of 400 rounds per minute from one gun, this equals one gun firing for 370 minutes, or 10 guns firing for 37 minutes, in December, and 10 guns firing for 52 minutes in January, so there is evidently plenty of room for development in this branch of warfare.]

We have carried out eleven raids into Germany in rather over two months—that is, since the 1st of December—while they have only succeeded in carrying out eight raids into Great Britain, and that in spite of the fact that London is a very much more accessible and easily reached target than anything that we can

operate against in Germany? [The query mark which appears at this point in Hansard seems justified.]

#### THE R.N.A.S.

Without disclosing any secret, it may be asserted with confidence that there is no one the German submarine commander is more anxious to shun than the British seaplane manned by the Royal Naval Air Service. The Commanders-in-Chief [sic] in Hansard. One commends it for adoption as one of the distinctive Air Force ranks of the future, both on the Western Front and in the other theatres of war, have borne eloquent testimony in their official dispatches to the splendid services which have been rendered by the squadrons of the Royal Naval Air Service under their orders.

#### MISCELLANEOUS BOUQUETS—CONDENSED.

No account of the activities of the Flying Services would be complete which omitted a well-deserved tribute to the pilots employed as instructors. As it was put to me, with bluntness but with truth, by an officer of great experience in training, "They spend many hours every fine day in the air with a young man who is doing his best, quite unintentionally, but nevertheless with disconcerting determination, to break their necks."

Last, but not least, let me say how much the flying men owe to the splendid work of the equipment officers and air mechanics who look after the machines.

Do not let hon. Members forget that what has been said about the Western Front applies equally to Mesopotamia, to Egypt, to Macedonia, and to every centre of operations, be it by land or sea, with which we are now engaged.

Australia has its own flying squadrons, which have rendered invaluable service at the front, and some of the most efficient officers and men in all branches of both wings of the Flying Corps have their homes in Canada, South Africa, New Zealand, and India.

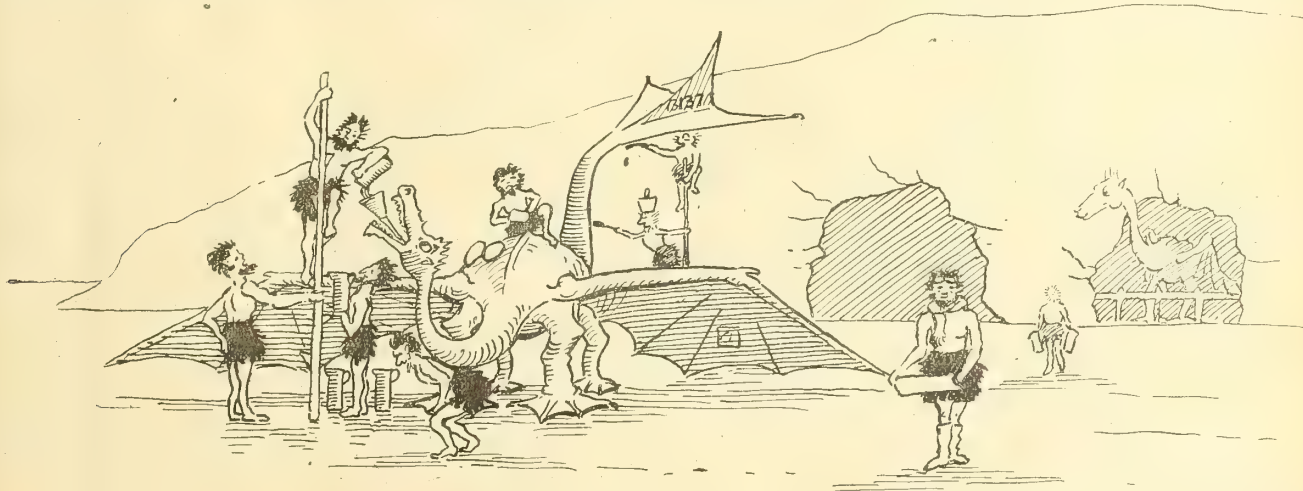
The comradeship of the air has indeed spun one more strand in that inviolable but unbreakable thread which unites all citizens of the Empire in advancing civilisation in times of peace and in defending it in war.

#### THE DEBATE.

[The speeches of all other Members have been condensed as much as possible.]

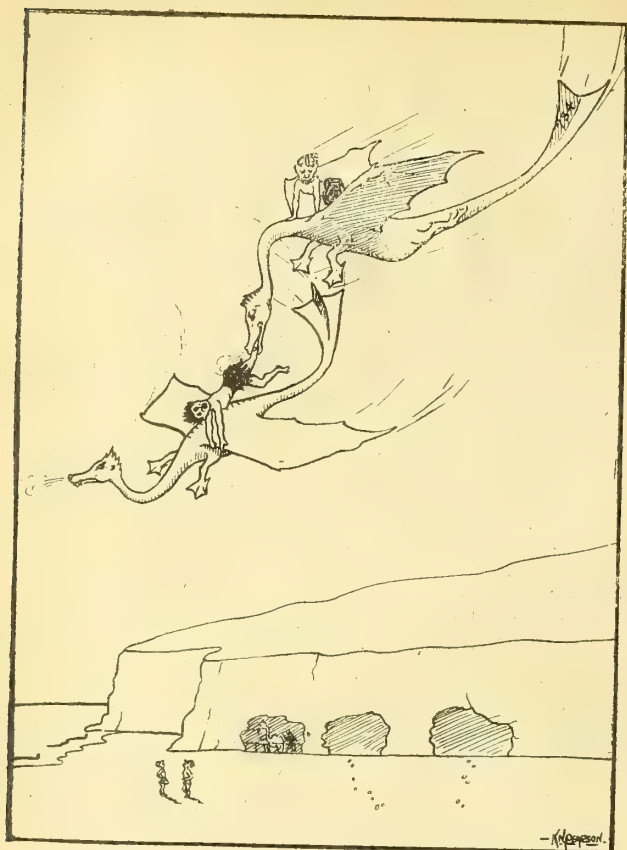
**Mr. Joynson-Hicks:** In times of peace I have criticised not only the personnel but also the supply of machines and other parts of the organisation, but I do not think it necessary now to make any criticisms of any kind with regard to our Air Service. Hardly a day ever passes without several people asking me, "Are you satisfied now, at last, with regard to the Air Service at the front?" One who strives at securing perfection can never perhaps be absolutely satisfied, but as far as anything short of perfection can go I am delighted to say that I am satisfied with the enormous advance made by the Air Service on the different fronts. [To paraphrase Lord Beaconsfield's remark on Mr. Gladstone's famous letter to the "Times," this sounds like the Pope blessing the world from the steps of St. Peter's.]

I suppose my hon. and gallant friend would hardly be satisfied if I did not say something in criticism of the speech he has made this afternoon, but not in any degree hostile criticism. I cannot help feeling that we are still largely in the same stage of transition as we were in when my hon. and gallant friend made his speech on the Second Reading of the Air Bill on the 13th November, 1917.



**LIGHT RELIEF.**—(The solidity of the reading matter in these pages seems to require a little light relief.) Herewith an R.F.C. officer depicts a Prehistoric Bomber about to start. His four-legged Pterodactyl may be biologically inaccurate, but it seems to have had advantages as an undercarriage proposition. The pathetic expression of the "spare machine" is noteworthy, as is the eagerness of the "bomber" for its ravitaillement.





### THE PREHISTORIC FLYING CORPS.

Training Division Orders.—“Pupils should be encouraged to practise aerial fighting.”

The Air Forces themselves are looking forward to the time when the hon. and gallant Gentleman will be able to announce to the House the issue of Orders in Council consolidating the two forces into one. [They are not. Far from it.]

Three months have elapsed since the Bill passed into law, and two months, or rather ten weeks, since the Air Council was created. I do not want to push the hon. and gallant Gentleman too far, but I do want him to use the utmost dispatch to secure the issue of the Orders in Council, so that we may have a real union and so that the Minister for the Air may be the real controlling factor to whom the officers of all ranks in the Royal Flying Corps may look, instead of, as at present, to the War Council or the Board of Admiralty, as their head. [The first of April is coming quite soon enough.]

In addition to that there is a real feeling of anxiety among these young men to know exactly what their position is going to be under these new Orders in Council. [True enough.]

My hon. and gallant Friend referred to the Medical Service. Here, again, I should think that between the Air Board and the Army there has been an accumulation of machinery set up which it would be much better to wipe out altogether. Let us have an Order in Council establishing the right of the Air Board to have a special Medical Service of its own, apart from the Army Medical Corps. [And quite right, too.]

I tell the hon. and gallant Gentleman that I can take him to a training detachment in this country where there are some 700 or 800 men under training who not only have no medical man attached to them, but whose aerodrome is not even in telephonic communication with a medical man. [Which is probably true and entirely disgraceful to the Admiralty or War Office, as the case may be.]

The question of the Medical Service leads me to the question of accidents.

I do not think any advantage would be gained if I were to give the House the total number of fatal accidents last year; it was very great. I am speaking now of purely training accidents, not out in France, but among those who are actually training here, and I want to ask my hon. and gallant Friend to overhaul the system of training. [The system of training in the R.F.C. is excellent, and not at all bad in the R.N.A.S. The only really avoidable accidents are those caused by fire, and that is a question which has been studiously neglected or muddled by the Technical Department.]

There was a very interesting article which appeared in the “British Medical Journal” last month, and which was written by Dr. Græme Anderson with regard to his own investigation of accidents, he having been for three years a medical officer in the Royal Naval Service in this country. He was dealing with the

statistics for six months, and in that period there were fifty-eight accidents—complete crashes, all of which were fatal to the aeroplanes themselves. The House will realise that the crashing of an aeroplane means the loss to the country of something like from £1,500 to £2,000, according to the type of the machine.

I think, out of forty-two cases, thirty-eight were due to errors in landing. Now “errors of judgment” is really only another name for insufficient training and insufficient practice. [Error of judgment means what it says, neither more nor less.]

When speaking in this House a few years ago on the same question of accidents, they were generally attributed to faults in the aeroplanes. I am speaking, of course, of pre-war accidents. In those days the men had more time to train and more leisure, and gradually the accidents grew fewer in number. [But were much more numerous in proportion than to-day.] But during the war the number of accidents has increased, and I am afraid it is likely to increase, because, instead of training on the older and slower type of aeroplane, as they formerly did, the men are now bound to train with the quicker and newer type of machine. [And under the new system are very much safer.]

The House will agree with me, I think, not only that a Medical Service should be established, but that there should also be a Chaplains’ Service for this new force. [A very sound suggestion, obviously overlooked by the great brains which hope to produce a parthenogenetic Air Force.]

I do not think I can give information to the enemy if I say that production has not come up to the figures of the estimated engine production given to this House by the Prime Minister in July of last year. I think that strikes could not have accounted for anything like the amount by which production fell below the estimate. Of course, with regard to strikes in this country and at this period, it is hardly necessary for any Member of Parliament to say a word as to the disloyalty, almost—[Why almost, and not quite?—treachery, of any man or woman who may engage in a strike at an aeroplane factory when the life and death of these men depend on the output of aeroplanes and aeroplane engines.]

I venture to suggest that my hon. and gallant friend should send some of his younger officers—perhaps some of the wounded men—back from the front right down into the aeroplane and engine factories of this country, in order that they might, heart to heart, tell the men and women working there something of the needs of the work, and the consequences of any delay in the output. [It was done long ago.]

I have a real faith in the working men of this country. I believe that if they are approached in the right spirit, and if my hon. and gallant friend will get some of those excellent young pilots to go to the Midlands and tell these men, heart to heart, the consequences of not turning out to the very utmost of their power aeroplanes and engines the workmen of this country will respond to his call, and that we shall hear nothing more in this present year of strikes in aeroplane works. [It would be a lot of use with the type of Bolshevik who boasts of having kicked wounded soldiers.]

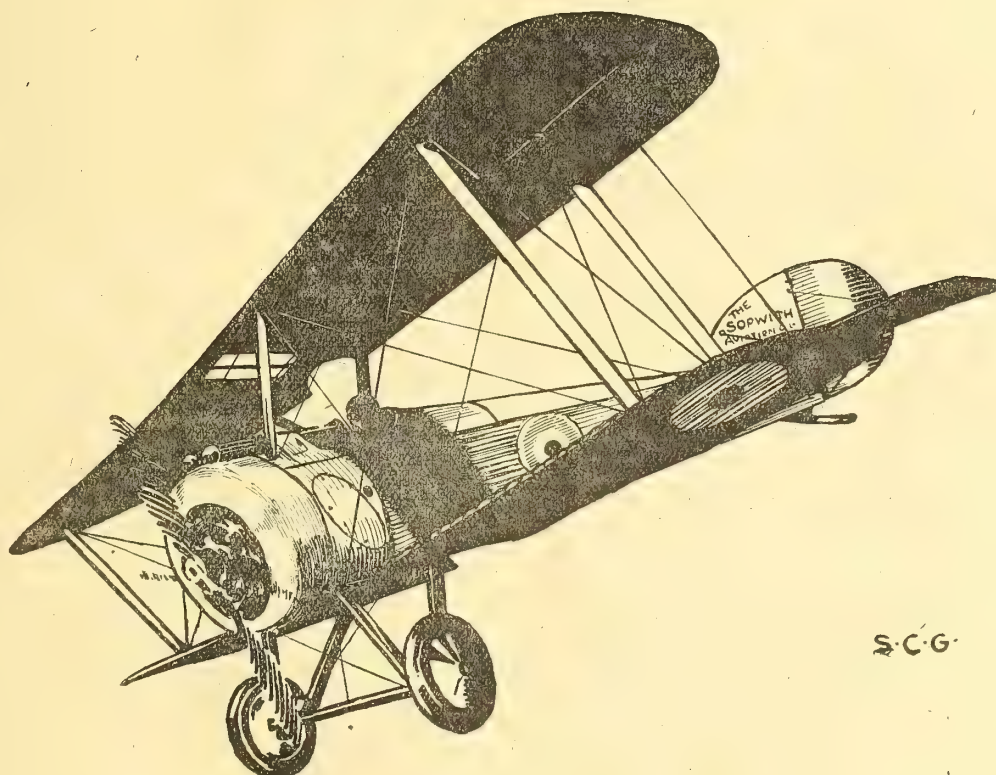
With regard to completely new machines, what I want to guard against is the constant tinkering alterations in the hope of getting small benefits and increases of speed on existing machines. The one message that I was given to bring back, from the highest to the lowest in the Services, was, “for God’s sake, tell them not to be always tinkering and trying to improve our machines. If you can give us a new one with an advance of fifteen or twenty miles an hour let us have it; but do not try to improve our existing machines by an increase of a mile or two an hour.” That is the fault of the Designing Department, and I rather want my hon. and gallant friend to put his heel a little on the Designing Department, and to try to prevent them making these constant alterations, which delay production more than anything else in the world. [Which is more or less true, but requires a great deal of discussion.]

I want my hon. and gallant friend to reduce the number of engines. It is no benefit to the enemy if I tell this House that at the end of last year there were actually being delivered, under contract, 28 different types of engines to our Air Services, without mentioning experimental engines which were also being constructed; 28 different types of engines, involving 28 different sets of spare parts! Very large numbers of these are bound to be useless as these engines are put out of utility, and I suggest that as soon as ever it is possible my hon. and gallant friend should follow the German principle of reducing the number of engines. I do not say standardise so as to prevent new improvements. Whenever I ask for standardisation I am told that that prevents new improvements; but it has not done so in Germany. Germany uses at the outside five or six types of engines. Let us use, then, eight or ten types, which would be ample, instead of the 28 different types being delivered at the end of last year. [Quite a sound suggestion, provided that more experiments are encouraged.]

Then I want a further output of engines. It is no good going on with our present factories. We must increase them, if necessary double them, and for that purpose he will have to go to the



# THE SOPWITH



**AVIATION COMPANY, LIMITED**  
**KINGSTON-ON-THAMES, ENGLAND.**  
CONTRACTORS TO H.M. GOVERNMENT.

Telephone: KINGSTON 1988 (8 lines).  
 Telegrams: SOPWITH, KINGSTON:



Paris Office :  
 21, RUE DU MONT THABOR.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



War Cabinet and say that this is really more important now than some other branch of munitions.

As to the efforts our American friends are making, it is rather curious that they do not feel any difficulty in giving some figures. They appear to have no Token Votes in the American House of Commons as we have here. I do not know why we should not have heard how much we are spending and the efforts we are making in regard to aeroplanes and air engines. It is very interesting to see that they really mean very definite work in this direction, and that the first appropriation of money made by the United States Congress for this matter was for 640,000,000 dollars. That is a very large sum for a first appropriation with regard to the provision of aeroplanes, and when one remembers that in America only a year ago, when they first came into the War, there was only one factory making aeroplanes, and those only training machines, that they had not a single factory making war machines, and that they had only 75 officers in their Air Corps, whereas to-day in the Equipment Department alone, after 11 months of war, they have over 400 men and 1,000 civilians working in order to turn out their share and quota of aeroplanes and aeroplane engines, some idea can be gathered of what the American effort means. [Either Mr. Joynson-Hicks or the American aeroplane makers seem to have been ill-informed as to what America was doing before joining in the war.]

My hon. and gallant friend should stir up both the Ministry of Munitions and the Board of Agriculture to grow more flax. Our American friends have noticed that, and they are dealing with the matter.

I do not know that I can ask him to go the length to which our American friends have gone, and to grow the castor oil beans in order to provide oil for the lubrication of the best engines. To show the thoroughness with which they are doing their part, I need only mention that they have sent to Bombay for these castor oil beans in order to grow the oil, so that when the time comes they shall not be short of this very necessary commodity.

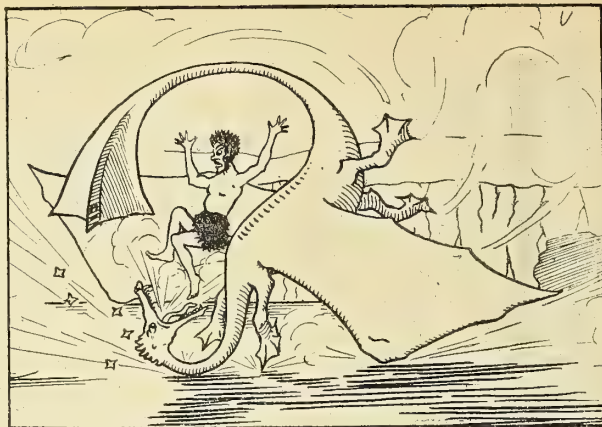
Our primary reliance must be upon ourselves. We went into this war without the United States, and kept in it without them for two and a-half years, and we are prepared to go through, even though we do not get the help that we expect from our Allies, and are prepared to depend upon our own right arm.

I come to my final question, that of reprisals. London must be defended, and is being defended very much better than it was. But I may remind my hon. friend that when we dealt with the defence of London we were told that it was impossible to bring machines from the front to defend London. The Under Secretary of State for War told us the other day that on one evening we had seventy machines up. But that involves a number of men and a number of machines and guns being kept here which otherwise would be used at the front. The invasion of London by Germany has a definite military object, and that military object has been achieved by the Germans coming to London, which keeps us using, night after night, here all these machines and men and an enormous mass of ammunition which would otherwise be used at the front. Does it not occur to my hon. friend that, if we were to make the same attacks on the Rhine that the Germans make on London, Germany would have to keep machines, men, and guns there, not on one spot, but along the whole of the Rhine? Every town would have to be guarded by the same number of guns and aeroplanes, and they would have to waste the same amount of ammunition as we have to do in regard to the defence of London.

I do not know the population of Trèves and Thionville, but I believe that it is something like from 50,000 to 70,000. But I am not satisfied with the bombing of these small towns. I do not think it will have the psychological effect upon the people of Germany which a real definite bombing raid upon Frankfurt, Cologne, Essen, Düsseldorf, or some of the large manufacturing towns on the Rhine, would have. A raid at this particular moment would have a great effect on the psychology and moral of the German people. The war will be won by whichever country can keep its moral longer.

It may be said that we have not the necessary machines. That undoubtedly is a sufficient answer on the part of Lord Rothermere. It is not a sufficient answer on the part of the Government, the bulk of whose members have been in office throughout the war. Everybody knows—I am giving no secrets away—that the machine upon which the Gotha was founded is an English machine, the Handley-Page machine, which has been in existence and working for over eighteen months. I do not know who is responsible for not having built that machine by hundreds, and, if necessary, by thousands. It could have been done.

I do not want to go into details, but I would like the hon. gentleman to come to the House, now that we have got an Air Ministry, an Air Council, and an Air Force, within the next month or two, and to state definitely, "We have laid down a policy which we believe will be efficient, and we believe that that policy can be carried out," and if that policy is not carried



**THE PREHISTORIC FLYING CORPS**  
Training Division.—A pupil makes a bad landing.

out by next year we shall be able to say to them, "You are responsible. You assured the House of Commons that you had laid down a scheme which you had satisfied yourselves could be carried out." We do not want to know the details, but we do want to say that you will be held responsible.

Mr. Harcourt made a brief speech with reference to the expenditure of some hundreds of thousands of pounds on an aerial gunnery school in Ayrshire, which has been abandoned.

Sir Watson Rutherford made a speech on the Whitehead Aircraft Co., in which the following passages occurred:—

It was borne in upon me, a few months ago, as an ordinary business man in the City of London, and as a member of this House, that this question of the Air Service was perhaps the most important question in relation to the war, and our success in it. I found that it was merely a question of output and the efficiency of the necessary machines. I went a step further, and thought I would make inquiries as to where and how our machines were at present being constructed. I selected the largest private enterprise works in existence in England. [This will be news to a good many people. One would like to know what proof was given to Sir Watson of the statement which he thus retails.] I went to see for myself, and to make inquiries as to the amount of output, and the conditions under which the work was being carried on. I found that these works had been established about three years ago, that during the last few months their output had been doubled, that it was now a very extensive place, and that the wage bill was £11,000 a week. I was at once informed that this particular works—and I have satisfied myself, as a business man, that it was a fact—could in three months double its present output if it had the money.

I asked, "Why cannot you get the money?" The reply was, "We have got the money offered us, but we are not allowed to take it." I said, "What, you have got the money offered you to double the output of this place in three months, and your output is one-fifteenth of the whole of the aeroplanes in the United Kingdom to-day, and you could double that in three months if you had the money, and you are not allowed to get it! What is the answer!" The answer was that they had got the money offered to them, that they had applied to the Treasury for permission to issue fresh capital, but the Fresh Issues Committee and the Treasury had prevented that issue from being made, and that capital being subscribed, and therefore had prevented the output from being doubled within the next three months. I think objection had been made six or eight months ago, and they were still being prevented. I put down a question on the subject in this House.

"Whether the Air Ministry have refused to recommend the Fresh Issues Committee at the Treasury to sanction the proposed increase of capital of Whitehead Aircraft (1917), Limited; and, if so, on what grounds; whether he is aware that this concern has within a few months doubled its output; whether he is aware that the concern could readily obtain the £750,000 additional capital it desires permission to issue and has acquired the necessary land, and could again double its output in a few months; and if he will explain why facilities for so doing should be withheld, having regard to the constant wastage and urgent necessity for properly constructed machines?"

The answer I received a few minutes ago is this, and it is absolutely untrue, to my knowledge:

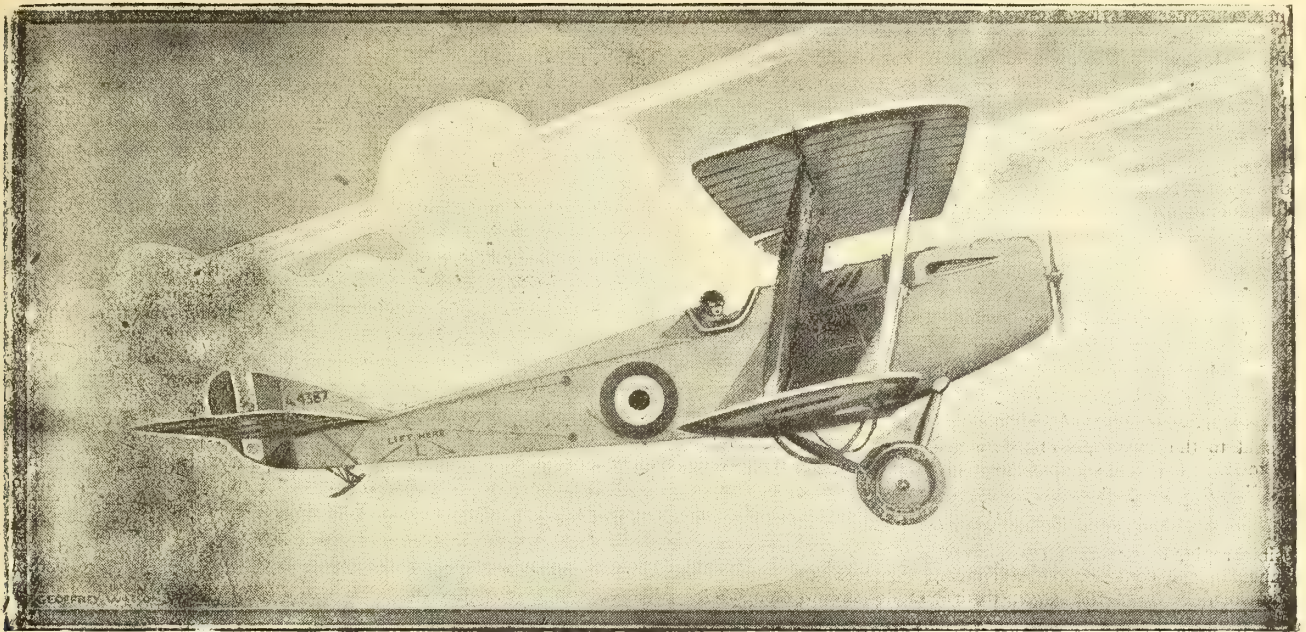
"The Ministry of Munitions will not oppose any reasonable scheme for raising capital by public issue."

That is exactly what they wanted to do in order to do good work, and it was refused. The answer goes on—

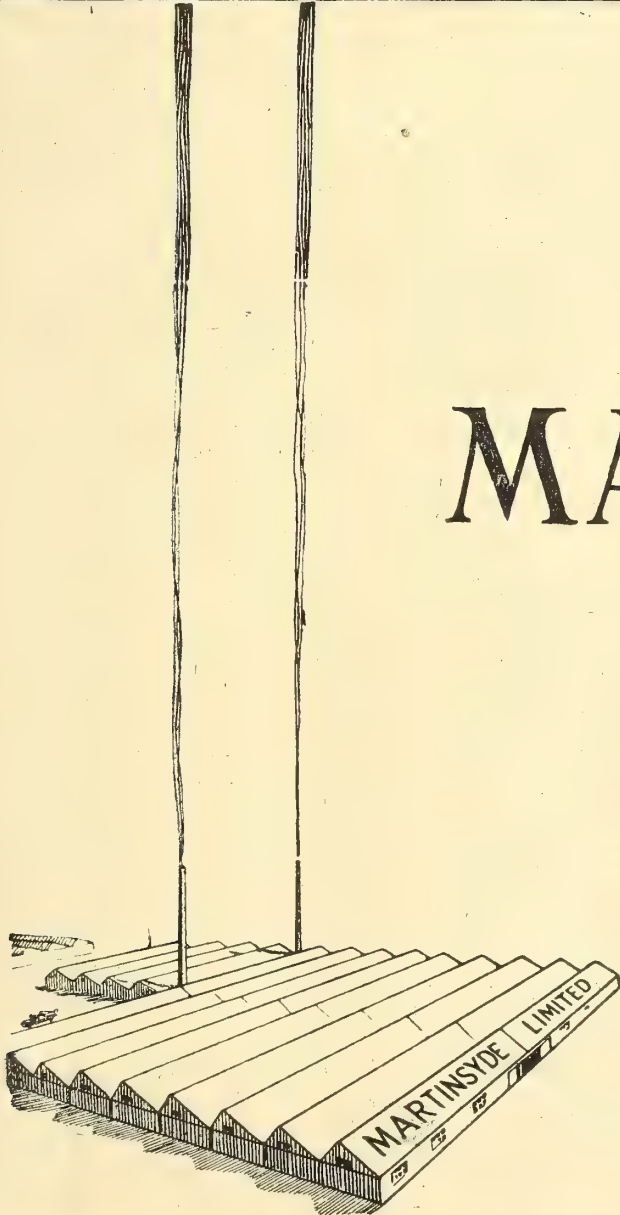
"The Ministry of Munitions can meet its programme of requirements from facilities existing and arranged for, without necessity of further extensions to Messrs. Whitehead."

Did anybody ever hear such an absurd reply as that? [Did anybody ever hear such an absurd speech as Sir Watson Rutherford





# MARTINSYDE



Aerodrome - and  
Auxiliary Works:  
BROOKLANDS.

Head Office  
& Works:  
WOKING, Surrey.





ford's? One recommends him to go and consult the files at Somerset House. It is disgraceful that the affairs of a private firm should be thus obtruded on a Service debate.]

The hon. and gallant member finished his reply to my question in this way:—

"The issue of capital is asked to pay off financial liabilities in the way of advances made by the Ministry of Munitions."

That is part of the answer which I do not hesitate to state is absolutely untrue. The amount that this company ask for authority to issue is £750,000. That is the amount which friends of theirs have offered to give them, and of which they have got the promise in cash in exchange for the shares. The Fresh Issues Committee refuse to authorise the issue of those shares unless the Air Board will give its support to the application. The Air Board have refused its support to the application, and, on what ground, heaven only knows! Those that are stated here are not true in the answer which has been given to me to-day. The total amount which the Ministry of Munitions have advanced to this concern is £200,000. The sum of £750,000 is not wanted to pay off only £200,000. The other £500,000 is wanted for the construction of new works.

I said to the managers of this concern, in which again I hope hon. members will believe me when I say I have no interest whatever, "What do you suppose for a moment, or what can you suggest will be the answer of this Government Department when I put this question?" They said, "We cannot think of a possible reply, except that there may not be a sufficiently rapid advance in the construction of engines in order to engine these aeroplanes, because the engines are made in another place." [Very ingenious and not very ingenuous.]

I said, "Supposing that was the answer," and the reply to me was, "We can make the engines and are willing to make them, and we can engine all our own aeroplanes if they would only allow us to get them constructed."

I am speaking somewhat strongly upon this question, because in several directions I have found that this Fresh Issues Committee has stood in the way of progress, has stood in the way of business, and at the present moment is standing in the way of our success in the war. [Sometimes it is right.]

#### THE AIR FORCE MEDICAL SERVICE.

Sir Watson Cheyne, the famous doctor, said: My name has been brought into this matter, and I feel bound to give some explanation of the medical aspect of medical attendance on the Air Forces. My first connection with this matter occurred when I was in France, inquiring into the question of the medical establishments of the Army last September. I received a letter stating that the Air Board were instituting a new Committee as to the Medical Service of the Air Forces. As soon as I came back I set to work to learn all I could about the medical question as it affects aviators, because I, like most other people, knew little or nothing before, because it had not come my way. We had a very powerful Committee. There were three or four independent of the Services, and some connected with the Services. The problem that we had to deal with was, of course, that of the accidents which occur in air work, and the question as to how far medical science could avert these accidents. One of the speakers to-day referred to a paper by Dr. Graeme Anderson—a very interesting paper—in the "Naval Medical Journal," and also published in some of the other medical papers, describing six months' experience in an aerodrome, and the thing that strikes one at once is that during those six months only fifty-eight crashes occurred, and only one of those fifty-eight crashes was due to a faulty machine.

The two chief conditions which concern us, so far as we know at present, are the atmospheric pressure and the density of the air—the density of the air especially, because with a suitable density of the air there is the amount of oxygen available, and without oxygen we cannot live.

In climbing a mountain 10,000 feet high you take a day or two to do it, and in that time there is a certain amount of accommodation, and as, I suppose all mountaineers know, people get sometimes mountain sickness or mountain faintness, and many people are very glad to come down. But the conditions in aviation are quite different. You go up 10,000 feet in a few minutes, and the human mechanism has not time to adapt itself, especially if you go still higher. After the aviator has mounted some distance he comes into air which does not contain so much oxygen as is necessary. He does not take in enough oxygen in one breath to meet the demands of the body, with the result that he begins to breathe faster. That does not suffice and the heart beats quicker to enable more oxygen to be taken in, and so you have a vicious circle established, until the aviator gets to a considerable height, when the heart begins to fail; he begins to lose consciousness; he may actually faint, and, although that is not always fatal, because in these modern machines there is a considerable amount of steadiness, I am afraid a good many people never recover from that faintness.

Nowadays, of course, aviators are provided with oxygen for inhalation when they find it necessary to employ it. Aviators differ very much in the heights they can go without the supply of oxygen.

The heart and lungs are not the only things concerned. Almost more important is the nervous system. On the earth it is customary to take things quietly. The nervous system is not subjected to sudden and violent shocks, but up in the air the nervous system is acting, quite unconsciously to the individual, of course, under great strain. The nervous mechanism is acting under great strain in maintaining the equilibrium of the aviator, and it is acting under great strain in many other ways. I do not know that any aviators are consciously frightened, but their nervous system is frightened, if you understand what I mean.

The great John Hunter, who lived in the eighteenth century, and about whom a lecture is delivered every second year in the Royal College of Surgeons—when my time came I spent nearly a year reading his books—spoke of the consciousness of the tissues. For instance, if a bone is broken and improperly set, the tissues build up a bridge to strengthen the part, and he speaks of that as a consciousness of the tissues, and, although the aviator is not having any feeling of fear, the brain is conscious of the dangers surrounding him, and is getting exhausted in its efforts to overcome those dangers, and where the exhaustion comes specially in is in a rapid descent from a high altitude.

Another important thing is the necessity of having true binocular vision, especially when travelling at a great speed, and of having a very rapid connection between the sight and the action; in fact, in selecting pilots, one of the most important points to ascertain is whether the binocular vision is good, and also the time it takes between the aviator seeing and taking action. Very often it has been discovered that one eye is not used at all. Many people are going about with one eye and are not using the binocular vision; that is an extremely dangerous thing. You could not allow a man to enter the Air Service unless you found he had proper binocular vision; otherwise he would kill himself and smash his machine. [This is very near a fallacy. Many first-class pilots have bad sight, and one at least has only one eye.]

That is a very short sketch of the points that occur to anyone who is studying the medical aspects of aviation. The question arises, How are you going to avoid these dangers?

For research the first thing is to find out the cause of all these troubles—the exact cause. For such research you want physiologists of high standing and you want physicians.

The next thing chiefly concerns the prevention of those accidents, and, of course, the first form of prevention is to keep out pilots who are likely to be subject to those troubles—for instance, men who have not proper binocular vision, men whose heart and lungs do not allow them to go to great heights, and men in whose case the movement between sight and action is slow. [One accepts these points with very distinct reservations.] Here, again, you need skill and special medical officers to make this examination.

This question of air medicine has not yet got into the schools. It is not taught.

The medical man must be in constant association with the aviator. There is a cumulative effect of high flying on the aviator. A man goes up the first day and he comes down again, and perhaps he is a little elated. The next day, and perhaps for three or four days, much the same will happen, but then he begins to find that he is not quite up to the mark. He also begins to find, or other people find for him, that his observations are not quite so accurate. In other words, the aviator is getting stale. The real function of the medical man attached to an aerodrome is to watch this point, because it may be that the man is sent up and he comes down with a crash and gets killed.

The trouble is that the best men are sent up. A superior officer wants a man, and he asks the commander to send along one of his best men—it may be from a unit where the medical man knows nothing about air illnesses. What it wants here is a medical man with some force of character, who will say in a case of that kind to the general, "You must not send that man; it is not safe." This is, I suggest, the chief function of a good air doctor.

A medical man should be about when men are being selected for special flights, to see that the men are in a fit condition to go up, and if they are not, to tell the commander that he must take somebody else. A man may have done himself pretty well the night before. It is then for the doctor to say to him, "My dear boy, you are not in a fit state to go up this morning." Not that he is seedy at all, but that he is not in that absolute state of training that he ought to be. In fact, a medical man of the Air Service ought to stand in much the same relation to the men as an athletic trainer to those whom he trains.

The Air Force in this respect needs very careful doctoring, and needs a better class of doctoring than either the Army or the Navy. I have heard many a doctor say that an aerodrome is a deplorable place to be sent to, for they have nothing to do. If this work is done properly you will need double the number of doctors at your aerodromes that you have at present.

There are also what may be termed air diseases. There is one disease which is, in my opinion, of importance, and that is



# MANN ECERTON & Co.Ltd.

CONTRACTORS TO THE ADMIRALTY  
AND H.M. WAR OFFICE.

Designers and  
Manufacturers of Proved  
Efficiency of all Types of  
**AIRCRAFT**

HEAD OFFICE AND WORKS

**AIRCRAFT WORKS, NORWICH**

---

SPECIAL DEPARTMENT

for the manufacture of

**AIRCRAFT ACCESSORIES**

(Strainers, Bolts and Nuts, etc., etc.)

177, CLEVELAND ST., LONDON, W.1.

# MANN ECERTON & Co.Ltd.

LONDON

NORWICH

IPSWICH

BURY ST. EDMUNDS.



what follows as the effect of reduced atmospheric pressure. Deep-sea fishermen will sometimes have noticed when they have pulled a fish up from the bottom something that looks like its stomach sticking out of its mouth. As a matter of fact, it is the air bladder of the fish, and it protrudes owing to reduction of the pressure from that in the depths where the fish lives, allowing gas to escape from its blood and tissues and collect in the gall bladder. A similar thing may apparently happen to the aviator at high altitudes. One of the things to which airmen fall victim to is distention of the intestine, leading to great pain and vomiting. The cause of this condition at first puzzled the medical officers very much, but, as a matter of fact, the intestines have become distended with gas, probably on account of the diminution in the air pressure, and he will get all right in a few days if he is only given a rest. [Readers of this paper will recall references at various times to a relation between this phenomenon and the "Caisson Disease," from which deep-sea divers suffer.]

Let me draw the conclusions that ought to be drawn from these points. The first conclusion is that the study of the special ailments and disabilities of flying men is as much a special subject as ophthalmology, bacteriology, etc. It follows as a corollary to the above that no medical man can reasonably expect to become efficient in the study and treatment of these disabilities unless he is prepared to devote the whole of his time and energy to the subject; and no medical man will be prepared to do this unless he can be reasonably assured of the opportunity permanently to pursue his studies and put them into practice. If, therefore, there is to be a serious attempt to deal satisfactorily with the various conditions in question, most of which are at present very imperfectly understood, it is essential to have a service of medical men specially trained for the work, accumulating knowledge with experience, with adequate inducements, to devote themselves wholeheartedly, and permanently, or quasi-permanently, to this work. By no other means can justice be done to the flying man.

The Flying Officers' Medical Committee came unanimously to the same conclusion. Further, it would be very illogical not to have a special Air Medical Service. You have a special Medical Service for the Navy and for the Army. You have a special Indian Medical Service. You have a special Police Medical Service; a special Post Office Medical Service; and also special Medical Services for the Home Office, the Local Government Service, in connection with the Education authorities; in fact, every Government Department has its own Medical Service except the Air Service.

The idea of those associated with me was that as the Army and the Navy between them apportioned off a certain number of doctors to the aerodromes to attend to the flying men that we ought to take over the whole of that Medical Service in England, and thus get the doctors which the Army and the Navy are at present supplying for this work as a nucleus of a larger and more satisfactory service. Then we would get our share of the new men, and a number of men who are too old for conscription but who would be very keen on this work would readily join it.

Another question which has been raised is in regard to the expense. It is said, "You are going to set up a new Medical Service with all the expense attached to such a service." I do not know what the cost will be. I know that something was said the other day about an aerodrome which cost £500,000, and which was abandoned. That would have paid for the Air Medical Service. As a matter of fact, two or three hours of Government expenditure would be sufficient to pay for the Medical Air Service.

**Mr. Billing:** It would be money well spent.

**Sir W. Cheyne:** What is the value of an efficient aviator? I am told that he costs the country about £900 and his machine roughly costs about £4,000. If an aviator is killed and his machine is wrecked roughly you lose about £5,000. Let us consider how many of those lives and machines could be saved in the course of a year. Let us place the number at one hundred, and if you place the cost at £5,000, then you save half a million of money and you pay for the expense of the whole of the Medical Air Service.

There is an idea that after the War we are going to have an Imperial Medical Service, and the doctors are to be told off to different branches of the Service. I fancy also that there will be an attempt at interchange of the doctors, and a medical man will be an air doctor for a time, and then he will probably be sent to some other Service. That does not help us, as it is not being started at the present time.

We have been asked, "Why cannot we go on as we are until the end of the War?" Well, I do not see anything like the end of the war in sight; in fact, I only see the beginning if we are to get any decent terms at all, and till the Germans are beaten and agree to put things right.

With regard to what has been arranged for the Air Service, the length of time which was taken in coming to a decision did not suit my mind at all. There is to be a Chairman of the Board, the Director of Naval Medical Service, and the next man is to

be the Director of the Army Medical Service, and the gentleman who represents the Air Service is to be a medical administrator. There is saying in Holy Writ that no man can serve two masters; still less can he serve three.

**Mr. MacVeagh:** The Government do not believe that.

**Sir W. Cheyne:** In that arrangement you have no permanence. Men are to be seconded, say from the Navy, for three years and then they go back. That is not a proper medical service. The Air Service will, however, be allowed to have a few officers with permanent rank.

I concluded that it was much better to take this compromise in the meantime, although I do not think it will work or meet the requirements of the Air Service. After the war you must certainly have a separate Medical Air Service. The Air Service is not going to be demobilised, but it is going to be one of our great national assets, and people who travel in aircraft will insist that the pilots are certified to be thoroughly fit by specially trained medical officers.

[A wholly admirable speech, which will be unanimously approved by all who have the welfare of the Air Force at heart. One regrets that it is impossible to print it in full.]

**Colonel Sir Hamar Greenwood** said:—I regret that Lord Rothermere is indisposed, and I regret the rumour that he is about to give up the position which he reluctantly undertook.

I support wholeheartedly what has been said by the hon. and gallant gentleman who has just resumed his seat. It is a positive scandal that this scientific Department of the Air Service has not got a scientific medical board perfectly free from the Royal Army Medical Corps.

One must regret that the hon. member did not stick to his guns. When he has been longer in this House he will know that no Government ever yields to argument. Force alone, backed up with something like ridicule and contempt, makes a Government yield.

This Committee, unanimous in its Report, is held up, not by any body of professional men equal to it, but by the Royal Army Medical Corps, that is determined to keep within its own control all the great positions, all the promotions, and the absolute mastery of this new force, with the initiation of which they have had nothing to do and in the medical arrangements for which they have, in my opinion, dismally failed.

I cannot but emphatically protest against the action taken by the Air Ministry in turning down this Medical Advisory Committee's Report, and in refusing to disclose to the House—I myself have asked for it several times—the Report itself.

I want to ask the hon. and gallant gentleman in charge of the Estimates if it is a fact that during the year 1917 we lost more flying men in schools of instruction than we did on all the fronts? I would like to ask him if he realises the agony of bereavement that comes to a father or mother whose son is not lost heroically fighting the enemy on any front, but whose son is lost through somebody's fault.

The Air Service is the only Service where the casualties in training are other than negligible.

#### MINISTERIAL INSULTS TO THE HOUSE.

**Colonel C. Lowther:** It does seem to me surprising and disconcerting, and it certainly augurs very badly for the future, that during a Debate on a Service, in whose superiority victory may depend, neither the Prime Minister nor the Leader of the House nor any Minister sitting upon that Front Bench has thought it worth while to be present. [The attitude and behaviour of Ministers in this respect is a national scandal.] It is proof beyond measure of the futility and the almost absurd position of the private member to-day. We are not wanted to suggest—people do not like us to advise—and as for criticism, it is regarded as a crime against the Holy of Holies.

My hon. friend the Member for Brentford (Mr. Joynson-Hicks) made a speech, full of information on a subject which he has studied, which he has made his own, and about which he knows more probably than anybody in this House, except, perhaps, the Under Secretary of State to the Air Ministry [That is a poor compliment to Mr. Joynson-Hicks.] That speech was hardly listened to. There was a sprinkling of members in the House. Two sleepy people sat upon one Front Bench and nobody upon the other. The position of the private member to-day is a very invidious one.

**Mr. Pringle:** He has only got himself to blame.

**Colonel Lowther:** I shall, therefore, confine myself to one subject, and that is the defence of London. In spite of the sanguine speech of the Under Secretary, it is an open secret that the defences of London, notwithstanding improvements are very inefficient and very inadequate. [It might be advisable for someone to take Colonel Lowther gently by the hand and educate him a trifle on this subject.]

Why should we have these repeated attacks on London and our unfortified towns? I do think there is a lack of ingenuity, a lack of brains, and a lack of imagination at Headquarters. I know that much has been done. But it is a matter the Government might well look into. I make it always not a



THE BRITISH & COLONIAL  
AEROPLANE CO., LIMITED

— FILTO , BRISTOL —

CONSTRUCTORS OF

*The "Bristol" Aeroplanes.*

— CONTRACTORS TO —  
H.M. AIR FORCES.

Telegrams :  
"AVIATION, BRISTOL."



Telephones :  
3906 BRISTOL  
(Private Branch Exchange)



duty but a pleasure to discuss this matter of the air with people who know better than myself, and there are many of them. I discuss it with every scientist I have met who is either engaged in designing, planning or constructing aircraft. I have discussed it with our expert airmen. If only the Parliamentary Secretary and the other members of the Government could hear what these men have to say, I feel certain that the Parliamentary Secretary would not have made that admirable but sanguine speech with which he began the debate. [If only Colonel Lowther would talk to the right people he would be much comforted.]

I am pleased that the system of reprisals has been accepted by the Government. I hope that now the system has really been adopted, there will be no cheap sentiment about whole-heartedly advocating reprisals.

If also we could only have some committee who would really seriously consider the ideas of young inventors for the defence of London it would require very little to make these attacks so hazardous and dangerous that they would be discontinued. [It would be a good idea to constitute Colonel Lowther a committee of one on the subject. It would keep him busy, and out of harm.]

Sir J. Walton said: I rise to deal with the question of the aerial gunnery station in Scotland, which was debated yesterday so far as the War Office control of works expenditure was concerned, but which we were told had since then been passed over to the control of the Air Force. We were told yesterday that the expenditure as made by the War Office, which has amounted to no less than £400,000, was made without the advice being first sought of competent expert civil engineers. I desire to ask on what expert advice of civil engineers the abandonment of this undertaking has taken place? I desire also to know what further expenditure will have to be made, in addition to the £400,000 mentioned yesterday, by the Air Force before the transaction is finally closed? We know perfectly well that possession was taken of a beautiful park and house and of farms, and that sheep and cattle were dispersed. We know, therefore, that there must remain a considerable further expenditure for reinstatement.

It is incredible that in spite of communications from the Member for the division, pointing out how impracticable the scheme was on many grounds, and that the military Royal Engineers also reported unfavourably on the scheme—though they would not contend it was absolutely impossible to carry it out, still it

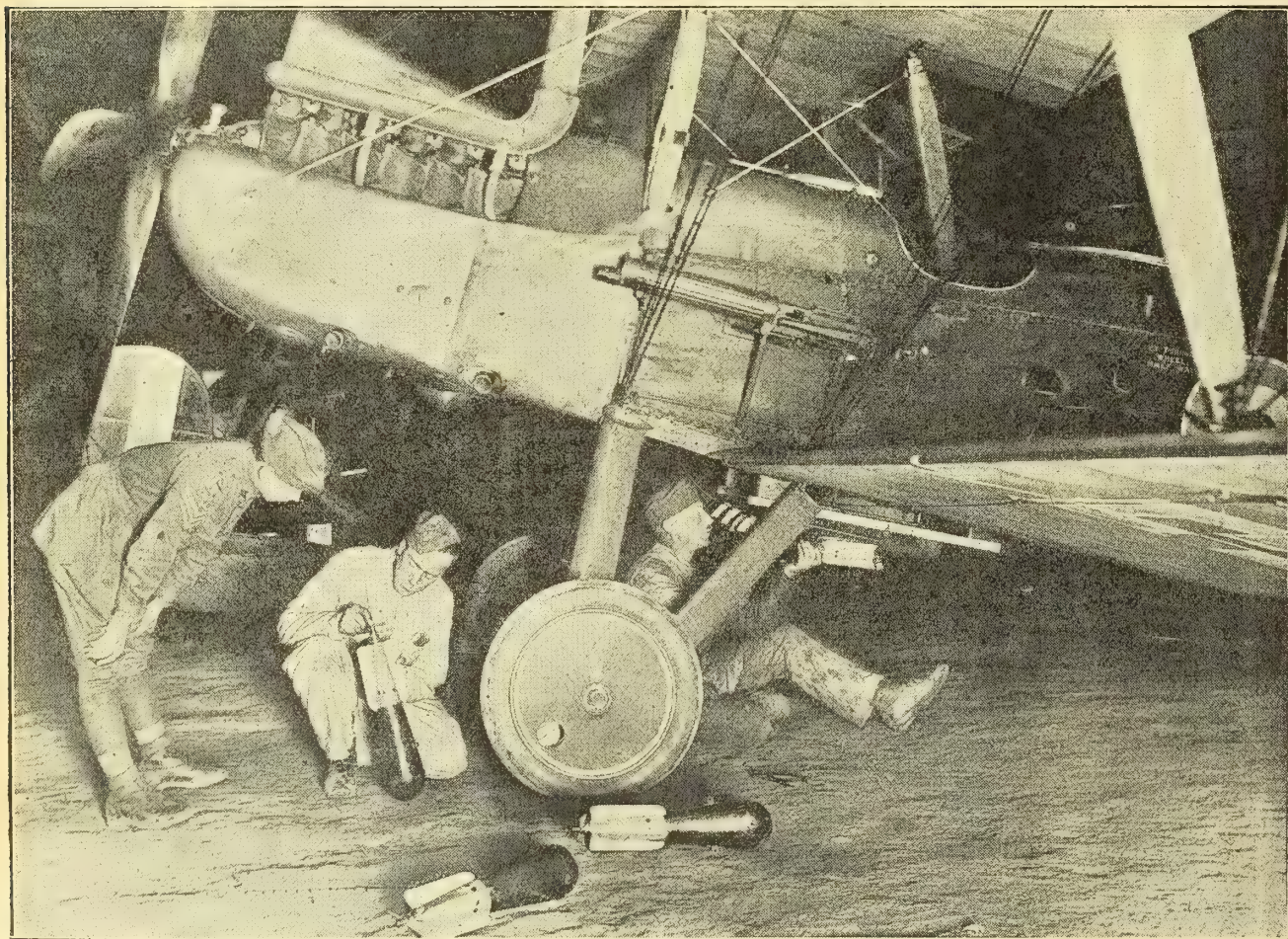
has proved impossible to carry it out; they attempted to drain with and drain bogs that could not be drained and reclaimed practically it is pretty certain that we have absolutely wasted over the undertaking, in what has already been paid and has got to be paid, £500,000.

Colonel Sir C. Seely said: I rise to support what fell from my hon. friends as to the very great desirability of the Air Ministry taking note of the very serious number of accidents which occur during the course of training in England. I can quite understand that in a Service so entirely new as this, which has really grown, one might almost say, from the beginning during the course of the war—[Though if Colonel J. E. B. Seely had done his duty when in office it would have been a great Service before the war, as in Germany.]—it is impossible to avoid a very large number of accidents, but I hope my hon. and gallant friend will report to his Board the feeling that has been expressed for very great care and every precaution they can take to diminish the number of accidents which are at present occurring. [Great care is taken and surprisingly few accidents occur. Under the new system they will be fewer still.]

I wish to ask the hon. and gallant gentleman if he can tell us what effect upon his Board the institution of the Versailles Council will have, to what extent their executive powers will apply to his Board, and what authority, if any, it will have to make demands upon him for personnel and for matériel irrespective of other demands for our own Services? [Quite an interesting question this, and wonderfully intelligent seeing who asked it.]

Reference has been made to the question of raids and reprisals. I do not like the word "reprisals," and I do not like the principle of reprisals. I do not think two wrongs make a right. [Opinions differ. For example, some people would not agree that the right way to test a country bridge for its ability to carry cavalry was to send a "tank" across it.]

If you really want to produce a moral effect upon the German, the real way to do it is by destroying submarines. If by means of a sufficient provision of aeroplanes you could ensure that any submarine within ten miles of these shores was discovered and sunk within a day or two, you would produce a moral effect upon the Germans enormously greater and out of all proportion to what you would do by dropping any number of bombs upon the civilian population anywhere in Germany. [And, pray, who is going to



*Australian Official Photograph.*

The Official Title is:—"Preparing for a bombing stunt." Though the picture is eminently serious, somehow the effect reminds one irresistibly of a stage setting by Mr. Harry Tate.



# ROLLS-ROYCE

Contractors to H.M. Government.

## Rolls-Royce Aircraft Engines

LIKE

## Rolls-Royce Cars

ARE

## The Best in the World.

### LONDON TO ROME IN 9 HOURS !

*Extract from "THE CAR," October 31st, 1917.*

"Some months ago a Handley-Page Biplane with ROLLS-ROYCE ENGINES carrying two Pilots and four Mechanics with all their luggage and many spare parts flew from London to an Aerodrome near Salonika . . . . No adjustments were made to either Machine or Engines on the way.

"Their actual time in the air was about nine hours as far as Rome, and if the machine had been carrying mails, only the two Pilots would have been needed, and they could have carried a couple of tons of mails."

THE USE OF  
THIS BADGE



is an indication  
that this Firm  
has been accept-  
ed as genuinely  
British by a Tri-  
bunal of Trade  
Competitors

ROLLS-ROYCE, Limited, 14 & 15, Conduit St., London, W.1.

Telegrams: Rolhead Reg., London. Telephone: 1654 Gerrard (3 lines).

AND AT

PARIS. NEW YORK. PETROGRAD. MADRID and BOMBAY.



tell the civilian population of Germany anything about our sinking their submarines? Does the sinking of our cargo ships full of food have as much moral effect as an air raid? Truly this is a more than ordinary ass. However, its brother was once War Minister.]

Sir W. Pearce also wailed about air raids.

Mr. Lynch said: I will begin with the highly interesting discourse from the hon. and gallant gentleman (Sir W. Cheyne), not only for its medical aspect, but because incidentally and without at all emphasising it he seemed to me to strike at the weak point in the whole position of the air defence of this country. Of all the heroes which the Air Service has yet produced, in France at any rate, none shine out more conspicuously, not only for dazzling courage, but for wonderful success, than Guynemer, and yet Guynemer was rejected, I am told, four times on medical grounds. It required extraordinary determination on his part to come up again and again for examination, and at length, by his persistence, force the gates. That is one instance where it is proved that the ordinary methods of medical examination are capable of giving a false result.

It has been assumed almost as an axiom that no man after a certain age is capable of being an air pilot, yet we have this singular fact, that one of the most daring feats in the whole war was executed by a pilot almost forty years of age, who, before the war, had no flying or military experience whatever, who was, in fact, a peaceful grocer in a French village. That is the case of the man who bombed Krupp's works.

There is another curious incident which reinforces the argument brought forward by my hon. and gallant friend who represents the universities; the most daring pilot may, after a comparatively short time, become so timid that he fears to ascend at all. [It is curious that no member referred to the effect of alcohol on the nerves.]

The hon. and gallant gentleman pointed out the difficulties of obtaining the necessary medical men; he said that the Military Service and the Naval Service had already secured all the available medical officers. The significance of that is, and this was what I foresaw when the Bill was passing through Parliament, that the same principle operates not only in the Medical Service, but right throughout the entire functions of the Air Service; and it is precisely that which is limiting its usefulness.

At a certain period of this war it was within the power of our Government to have developed such an Air Service that it would have been impossible for the Germans to have lived in the air at all, and that the mastery of the air would have been achieved just as decisively as, in the time of Nelson, the mastery of the sea was achieved. That opportunity was allowed to slip, not by direct decision, but by that fatal habit of hesitation, delay, drift.

As a representative of Ireland I will mention the neglect of the development of the Air Service in Ireland. This should not be a difficult problem at all. In Ireland you have all the facilities for producing a great aeroplane output. You have the land and you have the labour available, and it would be a benefit to Ireland and a great benefit to the whole country. That ground has been almost entirely neglected. I would like to have a clear and definite reply to the question why that is so.

Then there is the question of research and invention. Through the enterprise of one man in Paris, the famous engineer whose name is known worldwide by the Eiffel Tower, the French have had for long an experimental laboratory. I believe this was set up as a patriotic work by M. Eiffel at his own expense. The great advantage of that experimental laboratory is that the inventor who thinks that he has a good idea is able at a nominal cost—at the cost of some £8 or £10—to have a model of his aeroplane tested in the laboratory, aided by expert engineers, in such a way that the result is almost definite with regard to encouraging or discouraging the inventor. I do not think we have in this country anything quite corresponding to that. [The N.P.L. certainly does not correspond to it, for the N.P.L. is too busy about its friends' inventions to be bothered with anyone else.]

Another point about the (Eiffel) experimental laboratory is this, that it not only tests the models of the inventors, but the whole atmosphere which surrounds the institution is much more friendly and cordial than that which surrounds Government Departments in this country.

I have known inventors, and I have been compelled by experience to divide them into three great classes—(I.) the inspired, (II.) the inspired idiots, (III.) the idiots. I venture to say that the third class is by far the most numerous. Nevertheless, in such a vital matter as the Air Service there should be devised in this country, not merely a high and mighty intellectual scientific body, but a sort of intellectual network spread throughout the country, and this should be done so that very good and promising idea, even of a non-technical or ignorant man, could be caught and successfully fostered by having the brains of highly-trained men turn upon it, so as to save it and utilise it.

Turn, then, to the Naval Service. There are many ways of dealing with submarines in which a powerful aerial fleet could help enormously. One is by patrolling the Channel, and another, which I think much more likely to be profitable, is the development of that striking arm to such an extent that the bases of

the submarines could be destroyed, and it would thus be rendered impossible for enemy submarines to be constructed or to put out to sea. Then, again, if the Service were sufficiently developed the aeroplanes could be used in a direct way in naval battle.

[It is time for the Navy to note these facts. The torpedo-carrying aeroplanes has been foolishly neglected.]

On the military side there is a possibility first of all of using the aeroplanes directly as the cavalry of the air. It could be employed, further, in cutting the communications of the German Army, in destroying railways, in blowing up the bridges across the Rhine and the Meuse, thus forcing the armies on the Western Front to retire in order to escape the danger of starvation. It could also be employed in effective military raids. I refuse to accept the word "reprisal" in the sense in which it is often used. These raids upon London have a military value. I quite believe in any kind of reprisal if it have a corresponding military value, and I would like to see those reprisals intensified so as to become ten times the value of the original raid. [Most of which is being done so far as supplies permit.]

#### A CONSTRUCTIVE SPEECH.

Mr. Pemberton-Billing: This afternoon we have had another experience of an Air Debate in this House. We have seen an extraordinary interest evinced in the air in this House. We have had an audience which has fluctuated from five to twenty-five members. Is that because they are satisfied that all is well; is it because they are utterly exhausted with the general proceedings of the House, or is it because they think that criticism of any aeronautical matter at this late date can have no useful bearing on the issue of this war? I really do not know which it is, but it fills me not only with alarm, but with disgust.

If we had had a big air raid last night; if we had had, instead of two or three aeroplanes, 200 or 300 aeroplanes over London within the last few days, you would have seen a crowded House, because most probably the Prime Minister—in order to steady a distinctly unsteady Government made more unsteady by the public feeling which would have been aroused by such a dramatic incident as a big raid on this country—would have come down to this House, and hon. members would have flocked here in their hundreds, for two reasons. One, because of that curse of curiosity, which seems to be the only thing that ever fills this House, and the other because they felt that in the event of a division being taken and their names not being recorded in favour of desperate and immediate action against our enemy in the air, it would have gone against them at the next election.

If this House had taken some intelligent interest in the debate I should not have occupied the time of the benches in referring to that point. [The use of the word "benches" in speaking to an empty House is a neat touch of satire.]

Sir Watson Cheyne, with all the experience that age and learning can give, exposed to the House one of the weakest spots of our Service. The only thing I regret is that he did not stick to his guns.

In times of peace it might be possible for politicians to compromise, but in times of war we can only be fighting for one thing, and that is principle. Men argue about policy, they fight about principle, and when there is a principle at stake there can be no compromise. Either the hon. member knew that the medical history of our Air Service was right or it was wrong, and if he knew that it was wrong, I say here there should have been no compromise.

I have been accused of making violent speeches in this House, but it has always been my endeavour not to strike or introduce the personal note, or to introduce any animus in any speech I have made, but when this afternoon we were treated to a dissertation from the Treasury Bench by the present Under Secretary of State for the Air on "An Airman's Outings" I could not restrain myself—and I say it with all due deference to the Chair, trusting that no action of mine will ever suggest that I have not the greatest honour and respect for it—from interfering in such a way as to suggest to the hon. member that what this House wanted to know was not page 4 of the "Daily Mail" or "an airman's outings," but some cold facts about the Air Service as it is to-day.

First of all, I take exception to the fact that these estimates are introduced as a Token Vote. I suggest the Estimates would have been better introduced had we had the amount which it was proposed to expend on the Air Service announced to us here to-day. Is it £1,000,000, or is it £10,000,000? I do not think any hon. member, if he gives this matter thought, would suggest that by coming to this House and stating that it is proposed to spend ten, twenty, or fifty or a hundred millions—and I hold, and I am glad to say that gradually other members of this House are beginning to hold, the opinion that if £100,000,000 were spent on the Air Service it would be well spent—on the Air Service, that £50,000,000 was to be spent in training great raiding squadrons to carry our war into Germany, that would not have been a more satisfactory statement than coming here with a paltry Token Vote of £1,000 and wasting the time of the House with a dissertation on what airmen do?

I am quite sure the pilots to-day would far sooner hear what



# GNÔME & LE RHONE ENGINE COMPANY

Contractors to the  
War Office and Admiralty

London Offices :

27, BUCKINGHAM GATE, S.W.1., and THE HYDE, HENDON, N.W.9.

Works: Blackhorse Lane, Walthamstow.



we were going to do for them than a long dissertation on what they are doing for us. There is not a man in this country, there is not a woman in this country, but who not only knows but appreciates to the full what our airmen are doing for us. What I want to know is, what are we doing for them?

To send an ordinary medical practitioner down to an aerodrome to cool his heels where he simply sees, as the hon. and gallant member said, he has nothing to do, is no useful service to the fighting forces to-day. A medical man at an aerodrome should be the most occupied officer in the whole of that aerodrome. He does not want to bother the pilots, but he wants to mix with them, to watch them as a specialist watches peculiar nervous cases, without, however, letting them know that they are watched. He wants to be always the guide, philosopher, and friend to all pilots, especially young ones. He wants to have peculiar medical knowledge and peculiar and special training for his work.

There are very few pilots who do not know when they are beginning to get cold feet, but there is hardly a pilot who is prepared to admit it. When he comes down from a flight, or from returning from some particularly exciting or nerve-racking experience, and feels his nerves a bit shaky, a pilot feels that if he were to say so his fellow-officers would accuse him of having cold feet, and the next thing to happen would be to invalid him out of the Service because he was of no further use as a pilot. Fear of that sends many a man into the air, and is responsible for many of what we call the peace-deaths in flying.

If there was a sympathetic, experienced medical man, who only needed to look into the eye of a man when he came down, to see that his nerve was not what it had been; and if he were to simply say "stop flying for three days," it is almost impossible to exaggerate the enormous relief which that man would experience at getting the opportunity of restoring his nerve without having to admit that he gave in. That is why we want a Medical Service for the air.

What little weight I can bring to bear as an independent member of this House will be concentrated on endeavouring to get that medical service, because even I failed to appreciate the case for it to its full extent until I heard it this afternoon.

I come to the question of the Token Vote. He would be a capricious critic who would be prepared to say that our Air Service is not infinitely better to-day than it was a year ago, and infinitely, infinitely better than it was two years ago. But the Air Service to-day is as I would have wished to see it two years ago, and not as I would wish to see it to-day, and I hope that the House will appreciate that any criticism which I have to offer this evening is purely constructive. The whole of our Air Service now is in a condition of flux similar to that in which it was when the Air Force Bill was brought in.

The hon. member for Sunderland asked the question, which I hope will be answered, whether it is a fact that Lord Rothermere contemplates resigning from the position of Air Minister. I have my own views on the appointment of Lord Rothermere. Quite a number of the old Service men and of the present Service men knew that it was something in the nature of what I might call a Press appointment. The Prime Minister knew well that if he gave the position of Air Minister to the proprietor of a popular paper who was the brother of the proprietor of many other popular papers, the Air Service would loom large in the eyes of the public. It seems to me, if I may say so without disrespect, that the principal thing which occupies the mind of the Prime Minister is that he should get a good Press. We cannot beat the Germans with ink. Not only that, we cannot retain the confidence of the country with ink, no matter how much we spill.

But, for all that, from what I have heard since the appointment of Lord Rothermere, he has given exceptional signs, if not of brilliancy, at least of a thorough understanding of the problems, appreciating the difficulty of his own position with the multitude of counsellors advising him on a subject of which he was totally ignorant. That is a very difficult position for a man to be in, but, despite that, he seems to have had, according to my information, the strength to come to decisions to oppose even many interests which other men of less moral courage would have feared to affront, and by all accounts the position was improving steadily.

When the Air Force Bill was before this House I opposed many of its points to the full extent of which I was capable, but I am glad to say that though they gave themselves in the Bill powers to commit administrative blunders they have decided not to commit them. They have decided that the Naval Air Service, that is, the part of our air fleet which is essential to the well-being of the Grand Fleet, should remain under the command of the Grand Fleet, and that the part which is essential to the well-being of the Army in the field should remain under the command of the Army in the field, and they wish to build up a separate Air Force for the purpose of striking behind the enemy lines. That is well.

I do not think that the greatest optimist, not even the Prime Minister himself, who blows hot and cold through waves of public

feeling which so frequently govern his decision and judgment, can say that, taking all the fronts on which we are called upon to meet the Germans, there is any reasonable hope, in the next twelve months, of driving them back into their own country. I am confident that with an adequate Air Force we might bring this war to a successful conclusion in 1918, and sooner than by any other action or decision that our political or military advisers could take. It can only be done by making up your minds on one policy, and sticking to it through thick and thin. That policy, I submit, is to standardise.

#### STANDARDISATION.

Standardisation is a very serious policy even in commercial life, but when it comes to military life it is attended by even greater danger. But I put it to the Government that the time has come when it is possible to standardise three distinct types of machines which are necessary for our efficiency and for our success.

The time has also come when it is possible to standardise the three types of pilots. I see time wasted in training a man as a night flier who may be fit to be a day fighter and should be trained for that. If you are going to make a man a night-flying pilot you can train him approximately in three months. Make up your mind what you are going to do with a pilot, and train him for the purpose which he is competent to carry out.

There are three distinct jobs for pilots. The first job, which calls for the least skill, is night bombing. The man has simply to be able to judge a compass and read his instruments, and it is the simplest thing to teach him to fly as a night-flying bomber.

Then there is the question of the day-bombing machines. One of these machines requires a man of greater skill and of a totally different type of courage. The night flier deals with an unknown danger, the day bomber deals with a known danger, an apparent danger, and this is where our Medical Service can help us so much. In the case of the night-flying bomber who deals with an unknown danger, his nerves might possibly be affected if he were called upon to face a known danger. Again, the day-flying bomber has to fly a totally different machine, and some fighting experience is absolutely necessary, which, of course, means another type of man.

Some men rapidly develop as first-class air fighters, and other men when they become thirty or forty years of age. The man at the latter age becomes a first-class fighting pilot for the reason that he has been through all the experiences. He has taken all risks that have to be taken, and he settles down with a steady nerve.

What I want is that the Air Service should consider the advisability of training special men for special jobs, and should recognise that pilots are of three distinct types, and should be trained accordingly.

#### TYPES OF MACHINES.

We have the fact that we have three types of pilots, and we come to the other interesting fact that there are but four types of machines which it is necessary to standardise. The first type is the fighting machine, which I suggest should be standardised at least every month, and the drawings for that machine should only be given to firms capable of an output of at least twenty-five machines a week. If they are given a month's start and are only called upon to commence five weeks after their drawings, and if there is a competent drawing staff, or rather a competent distribution staff, they will find it possible to turn out the machines at the rate of twenty-five per week after five or six weeks' notice if there is any organisation, but that is only on the one condition that the Air Service standardises the fittings.

It is foolish to say that it is not possible to build ten types of machines with the one standard type of fitting. Men claim superiority in the performance of one aeroplane against another because some gadget which they have designed is fixed on it. If the authorities came and took the gadget off they would find that the performance was just the same. What is necessary for success is that every part of the aeroplane shall be one working harmonious whole.

The average designer likes to claim some particular point about his machine, and he adopts some elaborate form of fitting which most probably reduces the head resistance by half a square inch. Those elaborate fittings may require 500 or 600 drawings, and all previous fittings are scrapped, and the output is held up for five or six weeks, or sometimes for as many months, simply because the designer and the officials hold that a certain type of fitting must be put into the machine or the performance cannot be got out of it. That is all bunkum.

The people responsible for our Air Services to-day could simply decide round a conference table to standardise a certain type metal fitting. They could do so for four complete sets of fittings. They could have one for fighting machines, and they could standardise two complete sets of fittings for observation and day bombers, and they could standardise another set for night-flying machines, and then there would be some chance of standardising the general design of machine.

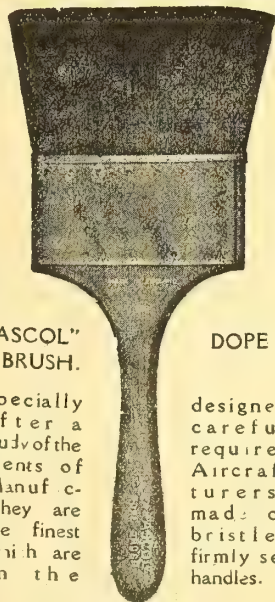
It has sometimes been found that there was a rotten performance, although the designer and the engine builder and all concerned had done their best, and then they happened to bring a man down who is a born erector, and he has made a few small adjustments and put up a performance of that machine beyond





## For Immediate Delivery.

We can supply large quantities from stock of "Ascol" Specialities here illustrated. Send us your requirements.



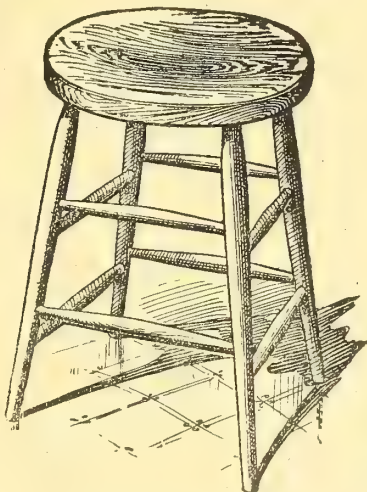
"ASCOL"  
BRUSH.

Specially after a study of the requirements of Manufacturers. They are the finest which are in the

DOPE

designed carefully to require Aircraft turers. made of bristles firmly set handles.

2in 2/6, 3in. 4/-, 4in. 5/- each.



FACTORY STOOLS  
(Wood).

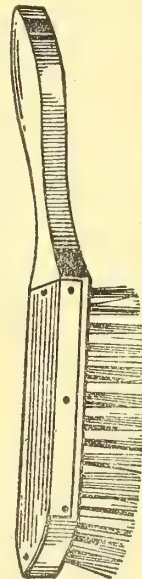
24 in high - 6/6 each



ENGINE  
BRUSH.  
8/6 and 9/6  
per dozen.

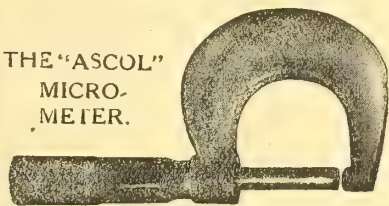


MCP  
BRUSH.  
4/2  
per dozen.



4-row  
SCRATCH  
BRUSH.  
(for burn shing  
16/- per dozen.

THE "ASCOL"  
MICRO-  
METER.



Adjustment keys are supplied with each Micrometer, although adjustment should not be necessary until the instrument has been in use for some time. 30/- and 32/6 each.



"ASCOL" FILE HANDLES.

3½ in. - 3/6  
per dozen.

4½ in. - 4/6  
per dozen.

For full particulars of these and other items see "Aircraft Supplies," our Fortnightly House Journal. Sent free to the Aircraft Industry on application on business stationery. Illustrated Leaflets dealing with these and other "Ascol" Specialities are now ready and will be sent free upon request.

## THE AIRCRAFT SUPPLIES COMPANY LTD

CONTRACTORS TO THE AIR BOARD.

Head Offices, Showrooms, and Stores:

ASCOL HOUSE, 125 LONG ACRE, LONDON, W.C.2.

Representatives in Birmingham, Manchester, Leeds, Belfast, Northern Counties and Scotland, South Coast and the London District.

Managing Director:  
G. H. MANSFIELD.

Works:  
Little James St.  
London, W.C.1.



Telephone:  
Garrar 276.  
(Private Branch Exchange.)

Telegrams:  
"Upcast, Rand,"  
London.



anything of its type before. The true success of a machine is in the little details, and is not in any way affected by the fittings pure and simple.

We come to the question of engines, and I think it is correct to say that the Naval Air Service has been employing twenty-six different types of engine and the Royal Flying Corps eighteen. I ask the four or five members who are present just to appreciate what it means to employ forty-four different types of engines with some two or three hundred spare parts for every engine.

The Germans have very little imagination, but we would do well to copy them in some things, and in this in particular. We would do well to copy them in the methods which save the labour that we employ in the production of machines—what a noble lord referred to in another place as “spit and polish”—which something like halves our output. Anyone who had the opportunity of inspecting a German machine would find, once you had torn the fabric off, the work underneath, while efficient, was comparatively rough. Where workmanship is not necessary it is not put in; where workmanship is necessary it is put in. If you want an example of that, how many German aeroplanes have crumpled up over England through their own volition? None that I know.

#### PHYSICAL AND FLYING TRAINING.

I would like to call the attention of the Air Ministry to the physical training which the American Air Service is now giving to its men. A pilot needs to be physically fit as well as mentally fit in every sense of the word, and the Americans are so decided on this point that they have actually appointed trainers, just as men are trained at baseball or boxing, to keep up the physical fitness of pilots and save them from hanging about and getting slack. The suggestion I make for the Air Force would be to encourage boxing and all forms of physical sport to keep the pilots physically as well as mentally fit. It encourages them enormously, and you will not have half the trouble with blood pressure and pulse beats if airmen are physically fit, instead of simply leaving it to them to take what exercise they deem fit.

I would like to congratulate the Air Service on deciding to abolish the old method of training, and I think we shall find in the forthcoming year that the deaths from training, which the hon. member regretted so much, will show a marked decrease in consequence.

#### DEFENCES.

The present Air Board has had a pretty good chance. The only thing they have done so far has been to set up a noisy defence of London, and to carry out one or two minor raids into Germany. They may have a very fine programme in view, but if anybody in their senses thinks that their noisy defence, or the hundreds of guns which we have set up in London had the effect, on Monday night, of driving off vast squadrons of enemy aeroplanes to Germany, they were never more deluded in their lives.

We want more co-ordination in the defence. We want a complete system if we are going to use anti-aircraft guns. I suggest that the employment of these guns as a defence against aeroplanes is utterly useless, except in the case of vast raiding squadrons. [It is just as well to be ready for them.]

If the ordinary small raiding squadrons want to go through the barrage let me assure the House they will go through it. Our own pilots have told me that it rather adds to the zest of fighting and flying over London to see the explosion of our own guns firing below. There is a considerable amount of damage done by our guns.

It is the wrong principle. It is the sort of thing that we have done all through this war. We waited till we were driven into a corner, and then we set up some sort of a defence. What we want, if I may repeat it to the House, is offence, and not defence. It has been proved by experience that the best way of getting the raiders is to wait till they start for home. We know whence they start; our Secret Service is sufficiently accurate for us to rely on them for this information. We ought to go over to the aerodromes whence they start, wait up in the air 15,000 feet till they come back, and when they are landing after having done their night's work, attack them. Our pilots know that these big Gothas, when they get within 400 feet of the ground, are almost unmanageable. That is the time for our men with their fighting machines to deal with them.

If it is considered that this bombardment in London gives any satisfaction to the citizens of London, perhaps it is politic to continue it. But for heaven's sake, I do appeal to the Air Board not to be satisfied, after setting up a sort of Chinese defence of London, to think that their duty ends. Surely we might have expected in the last six months some more substantial raids into Germany than those we have had.

#### UNDERGROUND AIRCRAFT HOUSING.

There is one more word of advice I should like to give to the Service before I sit down. Two years ago I pointed out to the then First Lord of the Admiralty that if it was contemplated building air fleets in any great quantity it was absolutely essential to build them underground. Aerodromes

ought to be put into the side of hills, and aeroplanes ought to be stored underground.

If ever the Germans really attack this country by air, the first thing they will do is to mark out our air factories—leaving the towns alone—mark out our big aerodromes, and concentrate an attack upon them upon a given night; we shall find that all these big factories we have built in certain spots, which I will not mention now, has been utterly bad policy, foolish and fatuous policy. That is, to build vast aeroplane factories in such exposed positions.

I do appeal to the Air Board to include this in their policy—that they will, for a start, build an aerodrome capable of holding a defensive fleet by cutting their way underground into the side of certain hills which I could suggest, but which I do not propose to mention here. [The word “aerodrome” may, one imagines, be used as correctly to describe the place whence aeroplanes fly as the place where they fly.]

This is a very simple matter. You have 100,000 Russians in London eating the food of our people and doing nothing in return. Why not get hold of them? A hundred thousand labourers ought to make a pretty good start in cutting into the side of a hill. Put your aeroplanes underground before it is too late. Do the same with your aeroplane factories.

If the Germans to-day had underground aerodromes in Flanders capable of holding 300 or 400 machines, what sort of a chance would we stand over here? What sort of a chance would we have if it were possible then for them to come up on to platforms from an underground aerodrome, and launch 200 or 300 machines from the Flanders coast, of dealing with them? [It is said that the Germans have one or two already.]

Every engine factory that is dealing with engines, every aeroplane factory, particularly those dealing with the finished machines, and every aerodrome where the finished articles are waiting employment, ought to be underground. There is no excuse, except lack of imagination and lack of foresight. [Further, one would point out that we have in London a number of the machines which bored the London Tubes. These machines, cutting the clean chalk of the Downs, could do the whole job inside three months.]

Any town in this country, if it is of military value to us, is fair spoil for German aircraft, and we should make up our minds that we will raid German towns no matter what British interests may be there, and no matter whether members of the Government or the House of Commons have interests in German towns.

I want to see a complete scientific attack carried out upon Germany through the air. I should like to see a military decision providing for putting the whole of our Armies on the Western Front on the defensive, and thus saving an enormous number of lives which otherwise would be lost. The Navy should also remain on the defensive, and we should concentrate on a great air offensive, which we could carry out at infinitely less cost both as regards personnel and material, and a much more decisive result would be attained.

The interest of this House in aviation is gradually becoming aroused, and I hope that hon. members who have spoken this afternoon will feel that in getting up and saying a few words this afternoon they have only been doing their duty to their constituents. I hope, however, that they will understand that there is a duty even greater, and it is a duty to those who have died for this country, and are dying to-day. It is our duty to harass the Government, if it is necessary, and even to risk losing all possible chance of knighthood, or the possibility of a job, and to offend the Government, when it is necessary, in order to drive home to them the absolute necessity of concentrating on the Air Service as our first and most important arm.

**Captain Sheehan** said:—I do not wish to follow the hon. member in a weary iteration of technical details which he has placed before the House. [That is the typical House of Commons view on a very sound constructive speech.] The hon. member remarked that at last the attention of this House was aroused, but that did not strike me on looking round and observing the state of the House.

What I rose specially for to-night is that I want to draw attention to the question of national aeroplane work in Ireland.

**Mr. Deputy-Speaker** (Mr. Whitley): I find in the Estimates that the Department referred to by the hon. member does not come on the Air Forces Vote. The manufacture of aeroplanes comes under the Ministry of Munitions, and it will be the Vote for the Ministry of Munitions that will give the opportunity to the hon. member of dealing with the distribution of orders and the methods of manufacture.

**Mr. T. Davies** supported the pleas of previous speakers for an Air Force Medical Service, and for more and better aeroplanes.

With regard to the defence of London he said: I can say from personal experience that that defence is very different from what it was six months ago. I do not say it is perfect, but I am told by those who ought to know that possibly in a month or two, provided the Air Council takes its courage in both hands and

(Continued on page 841)



WHITEHEAD

AIRCRAFT

GEORGE WATSON  
1917

RICHMOND  
SURREY



“ “ CONTRACTORS TO “ “  
HIS MAJESTY'S WAR OFFICE

*Messrs. Gordon Watney & Co. Ltd*

**AERONAUTICAL AND  
GENERAL ENGINEERS**

**South Lodge Motor Factory**

**WEYBRIDGE**



**Telephones WEYBRIDGE 550 (7 lines),**

**Telegrams: "MERCEDES, WEYBRIDGE."**

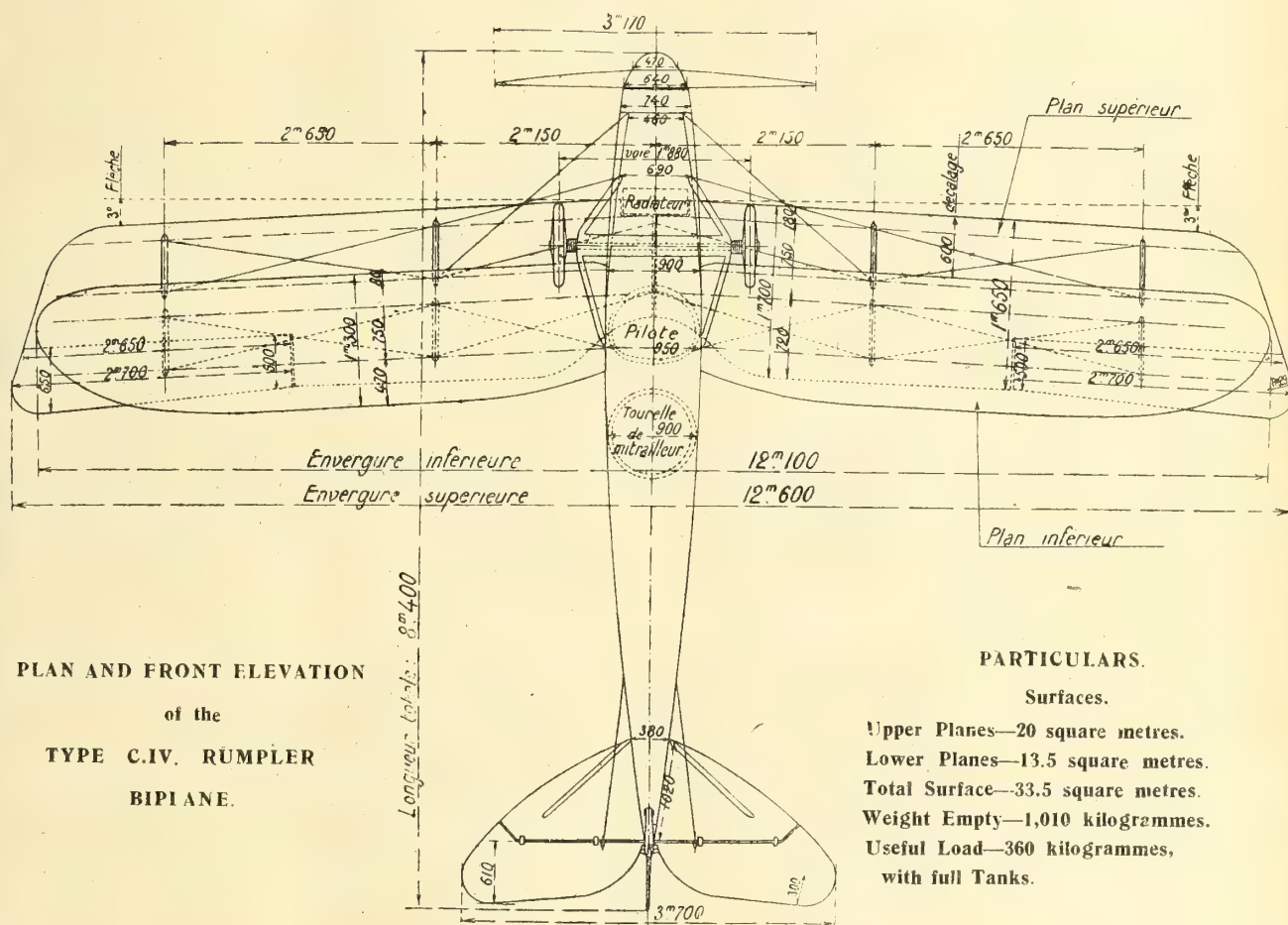


# AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER

## THE RUMPLER BIPLANE. TYPE C.IV.

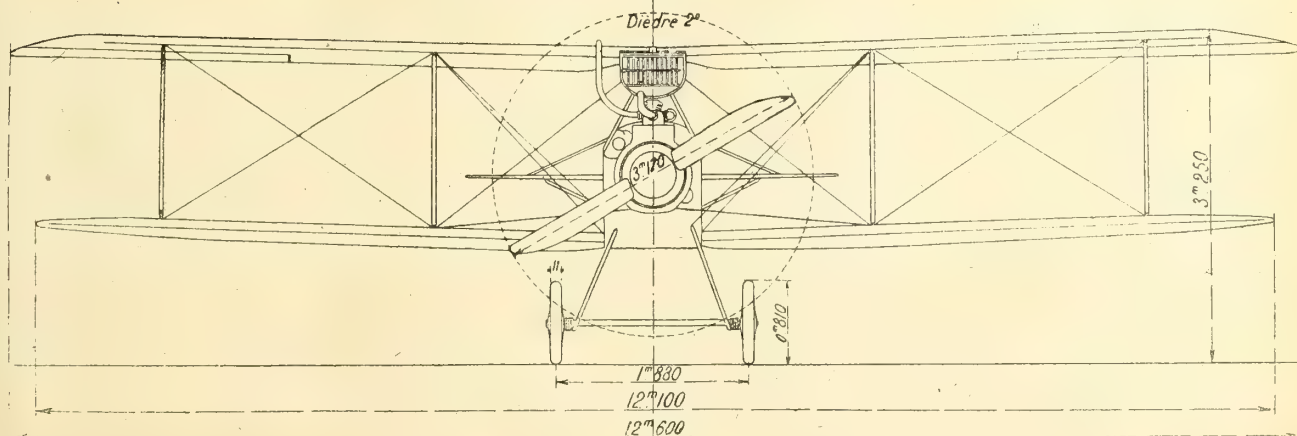


PLAN AND FRONT ELEVATION  
of the  
TYPE C.IV. RUMPLER  
BIPLANE.

### PARTICULARS.

#### Surfaces.

Upper Planes—20 square metres.  
Lower Planes—13.5 square metres.  
Total Surface—33.5 square metres.  
Weight Empty—1,010 kilogrammes.  
Useful Load—360 kilogrammes,  
with full Tanks.





**THE RUMPLER BIPLANE. TYPE C.IV.**

The following particulars are taken, with acknowledgments, from the French technical journal, "L'Aérophile" for Jan., 1918.

The machine described is of the "C" class, which embraces aeroplanes devoted to Army Corps observation, and frequently called general purpose machines, and is possibly the best of its type.

It is, in any case, the most interesting of its class, because of its great speed, which equals that of a fighting machine, at its ceiling (6,500 metres—about 21,000 feet).

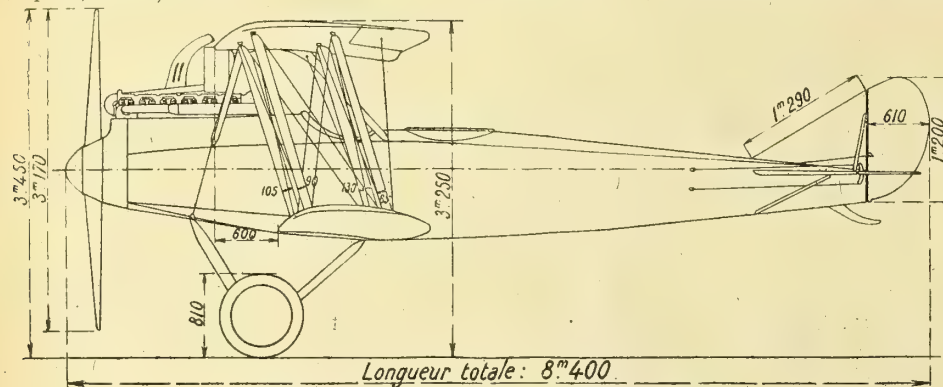
The high-flying qualities of the machine have caused the Germans to use a respiratory apparatus recently adopted. The ascensional speed of the Rumpler is also considerable, namely, 5,000 metres (16,250 feet) in 35 minutes, with military load.

Although it possesses numerous points of resemblance with the Rumpler C.III (160-h.p. Mercedes engine), Type 1916, the C.IV is larger in several of its dimensions, being 0.5 m. longer, and 0.35 m. greater in span.

COMPARATIVE TABLE.

	Rumpler C.III.	Rumpler C.IV.
Span, upper plane .....	12.25 m.	12.60 m.
Span, lower plane .....	11.05 m.	12.10 m.
Length, total .....	7.90 m.	8.40 m.
Height .....	3.20 m.	3.25 m.
Weight, empty .....	828 kg.	1,010 kg.

(N.B.—A metre is equivalent to  $3\frac{1}{4}$  feet, about. A kilogramme =  $2\frac{1}{4}$  lbs., about.)



Side View of the C.IV Type Rumpler Biplane.

The upper and lower wings of the C.IV. are both "V"-shaped, and are set back at an angle of 3 degrees. A dihedral angle is formed by raising each wing 2 degrees, in one example,  $2\frac{1}{2}$  degrees.

The wings are staggered, the leading edge of the upper plane being 0.60 m. in front of the lower.

The trailing edges are rigid.

The ribs are built of three-ply, and are spaced at intervals of 0.30 m. Their incidence has a uniform angle of 5 degrees.

One machine, however, had the following adjustment; 1st rib, 3 deg.; 5th rib, 5 deg.; 11th rib,  $4\frac{1}{2}$  deg.; 14th rib,  $4\frac{1}{2}$  deg.

[It occurs to one that this particular machine was badly out of truth.—Ed.]

**UPPER WINGS.**

The upper wings, viewed in plan, are trapezoidal, with rounded

corners. They are cut away at the rear over the fuselage, so that a semi-circular space is left above the pilot's head.

Their maximum chord is 1.7 m.

Each upper wing has 19 main ribs and five distance pieces formed of steel tubing. It has a slightly projecting aileron, which tapers inwards from 0.65 m. to 0.50 m. The aileron is 2.65 m. wide at its hinge, and 2.70 m. at its trailing edge.

**LOWER WINGS.**

The lower wings, in common with other German machines, for example, the D.F.W., are rounded at their ends.

The radius of the arc which forms the rear edge of the wing-tip is greater than the arc which forms the front edge, and the wing has, therefore, something of the shape of the blade of an airscrew—or what the French call "banana-shaped."

Each lower wing has 17 main ribs and 4 steel distance pieces. A sheet of three-ply wood, covered with metal, which is 0.2 m. wide, serves as a footboard along the wing for the pilot, when climbing into the machine.

**STRUTS.**

The interplane struts, of which there are two pairs on each side, are oblique, but parallel.

The sizes of the different struts vary. The inner front row struts are 0.105 m. deep, the inner rear struts are 0.130 m. deep. The front row outer struts are 0.090 m. deep, and the rear outer struts are 0.085 m. deep.

The gap between the planes is 1.85 m., stagger included, the measurement being taken from spar to spar.

**SURFACE.**

The total lifting surface is 33.50 square metres, the area of the upper wings being 20 sq. m., and that of the lower wings being 13.50 sq. m.

The cabane remains the same as that of earlier Rumplers.

**TAIL DETAILS.**

As regards the tail, the stabilizing plane is fixed and not adjustable, and is much smaller than in earlier models. Its leading edge is approximately semi-circular.

It is held in place by a strut which runs up from the bottom of the fuselage on either side. Two similar struts run from the upper surface of this plane to the fixed vertical fin.

The stays which link the bottom side of the stabilizing plane with the fuselage are constructed of flattened tube, on the lower surface of which is placed a row of metal spikes with sharp edges. Their purpose is apparently to prevent the handling party from grasping them to shift the machine about. The device is found also on the Rumpler C.III type.

[It seems a thoroughly Hunnish alternative to painting "Lift Here" on the sides of the fuselage, as is our custom.—Ed.]

The elevator is formed of two flaps, each compensated by a small triangular section which projects in front of the hinge. Otherwise, the arrangement has not been altered, and is similar to that found in other German machines. The control flaps together are 3.70 m. wide and 0.61 m. deep.

**VERTICAL SURFACES.**

The vertical fin remains unchanged, but owing to the decrease in the depth of the fixed tail plane, its front point is found in a line with the leading edge of the said tail plane.

The rudder is not balanced, and retains the same form as that of C.III. It is 0.61 m. wide, and its greatest height from the base of the fuselage upwards is 1.2 m.

As hitherto, the internal construction of all these members consists of steel tube.

**CONTROL FITTINGS.**

The cables which operate the controls pass through the inside of the fuselage. In order to avoid obstructions they are carried in small wooden guide tubes.

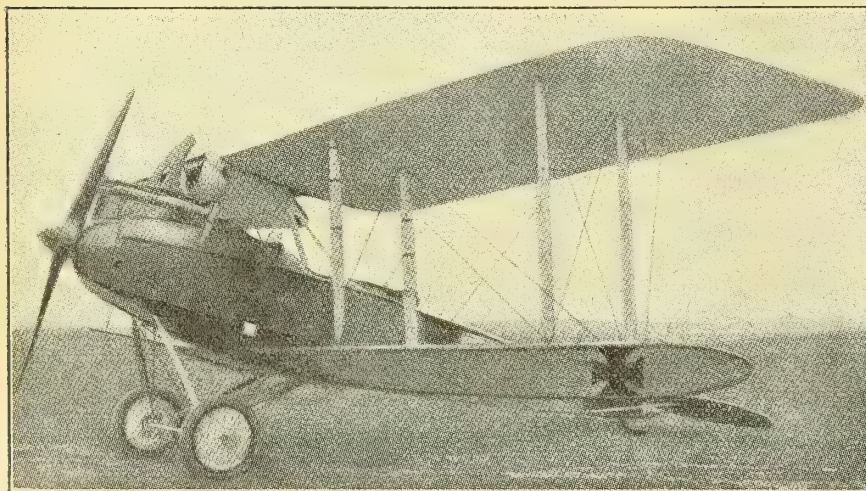
**FUSELAGE CONSTRUCTION.**

The fuselage is rectangular with a rounded top, and is 0.95 m. wide at the pilot's seat. It tapers towards the rear to a vertical knife-edge.

Its construction is conventional. There are four longerons with uprights and cross pieces held by crossed piano wires. To the front and the rear three-ply wood is fitted. The middle is covered with fabric.

**THE AIRSCREW.**

The Rumpler C.IV has a Heine airscrew, the diameter of which is 3.17 m. In front of the airscrew is the revolving pot



Three-quarter Side View of the C.IV Rumpler. The black cross has evidently been "faked" onto the photograph, as it is entirely out of perspective.



# WESTLAND *Aircraft.*

WESTLAND AIRCRAFT WORKS.

BRANCH OF PETTERS LIMTD.

YEOVIL.

*Phone, Yeovil 141. Telegram Aircraft Yeovil.*





common to German aeroplanes. On certain machines recently captured, this cap or pot is replaced by a small cone fixed in front of the propeller boss.

#### THE ENGINE.

The motor is a 260-h.p. Mercedes, or a 250-h.p. Maybach, in each case a 6-cyl. water-cooled engine.

In the first case, the motor is found slightly inclined towards the right—[literal translation.—Ed.]—to permit the inlet pipes to pass between the struts of the cabane.

[It seems probable that the author means that one engine-bearer is higher than the other, thus tilting the cylinders to one side without altering the position of the crankshaft.—Ed.]

The Maybach motor offers less obstruction, and does not require to be so arranged.

#### TANKS.

The motor is fed by two petrol tanks, the principal (about 220 litres) being found under the pilot's seat, and the second, an auxiliary tank, is placed behind the pilot's back and in front of the gun-ring.

The contents of these tanks permit of a flight of about 4 hours' duration.

[A considerable reduction below common practice, and obviously intended to give increased climbing speed.—Ed.]

The exhaust gases pass overhead through a central chimney, to which are connected six tubes leading from the cylinders. This chimney, which curves backwards, is divided halfway up into three branches for a length of 0.20 m., probably an attempt at silencing.

#### RADIATORS.

The honeycomb radiator is placed, as before, on the two front struts of the cabane, and to the front of the upper plane. It remains nearly semi-circular. There is a series of small shutters facing the direction of travel which can be adjusted at the will of the pilot. Their purpose, like similar devices in Allied aero-

planes, is to cover the radiating surface, and to modify the cooling of the water in the radiator.

#### SEATING ARRANGEMENTS.

Behind the motor is the pilot's seat, and still further back is the passenger's seat, surrounded by a revolving machine-gun ring, 0.90 m. in diameter, with a support for a "Parabellum" machine-gun. The pilot and passenger are placed very close to one another.

In the passenger's cockpit, accommodation is provided for a "barrel" bomb chamber, holding four bombs, as is usually employed on German aeroplanes.

An opening in the floor is provided for photography.

A wooden tube, through which one can see from the interior of the fuselage, serves as a socket for the bomb sight.

Wireless telegraphy apparatus is installed in the machine.

#### THE UNDER-CARRIAGE.

The under-carriage has a track of 1.88 m. (7 centimetres less than that of Rumper C.III), and carries a pair of wheels 810 by 110 mm. The axle on which these wheels run is enclosed by a split fairing which tapers backwards.

Spring suspension is obtained by elastic cord.

There is no claw brake.

#### EXTRA BRACING.

A cable, acting as a drag-wire, runs from the front of the fuselage to the base of the front inner interplane strut. At the top of the same strut is attached a cable running to the front under-carriage strut. These cables were not found in some examples of the C.III type.

The tail skid presents no special features.

#### COLORATION.

In the machine examined, the under surfaces of the wings were painted a sky-blue colour. The sides and top of the fuselage and the tops of the wings were camouflaged with green and brown.

## THE DEATH OF LOUIS SEGUIN.

The death is announced of M. Louis Seguin, chief of the Administrative Department of the Société Gnome et Rhône of Paris, who passed away on Jan. 7th.

Louis Seguin is best known to those concerned with aviation for his pioneer work in connection with the first successful rotary aero motor, the Gnome engine, although actually his activities covered a much wider sphere. He was a grandson of the famous Marc Seguin, the promoter of the tubular boiler and the suspension bridge, and as a natural result, carried on with his brother, M. Laurent Seguin, the family mechanical engineering tradition.

Louis Seguin was born in 1869 at Saint-Pierre-la-Palud (Rhône), and passed out of the Ecole Centrale in 1892, seventh on the list.

In 1895 he founded the Gnome motor business, which eventually produced the Rhône rotary engine. Louis Seguin was also concerned with other industrial activities where his exceptional abilities as technician and organiser won him success. Notable concerns which he directed were the Société de Fonderies de Cuivre of Lyon, Nacon and Paris, and the Société Hydraulique of Fure, Morge and Vizille. As a recognition of the service he had rendered he was made a Chevalier of the Legion of Honour.

The Gnome engine deserves many thanks from all those who now earn their bread by aircraft work, not only because it was the forerunner of the modern rotary engine, which has played such an important part in the history of aerial warfare, but because it was the making of the aeroplane in the fateful year 1909, when the possibilities of the aeroplane first began to appeal to the world at large.

The earlier pioneers, starting from Santos Dumont and the Wright Brothers, did wonderful things with the stationary petrol engine, but its weight prohibited anything approaching efficiency, and cooling difficulties checked the duration of the flights. On the other hand, the Gnome needed no complicated cooling devices, and because of its extreme lightness it enabled aeroplanes which could only stagger off the ground to fly respectably, and, what was still more important, the Gnome flew various aeroplanes quite comfortably which had such a small margin of lift that with any other engine they would never have flown.

Its first public appearance was on the Voisin biplane, flown by M. Louis Paulhan, at the great Reims aeroplane meeting in 1909, when it created a profound impression, and was quickly fitted to the Blériot monoplanes and Farman biplanes, and all manner of other machines.

It is impossible to give a complete record of the classic flights performed by aeroplanes fitted with the Gnome, and later also with its sister engine, the Rhône, a rotary engine which was developed independently, and afterwards controlled by the Gnome Company.

However, the following are notable occasions on which the engines proved victorious:—

The Coupe Michelin, Nov. 3rd, 1909, won by Henry Farman, on a Farman biplane, with a flight of 234 kms. in 4 hrs. 17½ mins.

London to Manchester, April, 1910, won by Louis Paulhan, on a Farman biplane, with 50-h.p. Gnome.

The Circuit de l'Est, Aug. 1910, won by Alfred Leblanc, on a Blériot monoplane, with a 50-h.p. Gnome.

The European Circuit, June, 1911, won by "André Beaumont" on a Blériot monoplane, with a 50-h.p. Gnome.

The Circuit of Britain, July, 1911, won by "André Beaumont" on a Blériot monoplane, 50-h.p. Gnome.

The Gordon-Bennett Race, July, 1911, won by Henry Weymann on a Nieuport monoplane, with a 70-h.p. Gnome.

During 1912-13 and 14 the records and races won by the Gnome and Rhône were legion.

Outstanding events were the Monaco-Schneider Cup race, won by Mr. Pixton in 1913, on a Sopwith seaplane, fitted with a 100-h.p. Monosoupape Gnome, and the London-Paris-London race, won by Walter Brock in 1914, on a Morane monoplane fitted with an 80-h.p. Rhône engine.

Of war service, little can be said regarding the ubiquity of these engines. The first Zeppelin to be destroyed in its shed was bombed by a Sopwith biplane fitted with a Gnome.

The only occasion on which the British bombed Friedrichshafen (in Nov., 1914) saw three Avro biplanes in action, with Gnomes.

The first aeroplane to destroy a Zeppelin in mid-air was an Avro biplane fitted with an 80-h.p. Gnome, piloted by Flt. Lt. Bigsworth.

## THE DEATH OF MR. THOMAS TYRER.

The Aircraft Industry has experienced a great loss by the death of Mr. Thomas Tyrer, who passed away suddenly on Feb. 20th. Mr. Tyrer was best known to those concerned with industrial aeronautics for his association with the Dope Industry, as he was a Director of the Cellon Company, and acted also as chemical consultant to that firm.

With Mr. Tyrer, the Aircraft Industry was only a side issue, for he played for many years an historic part in chemistry as applied to commercial manufacturing generally, and was recognised especially as an authority on the use of alcohol for industrial purposes.

He took a personal part in the campaign organised by the various chemical societies for the abolition of duty from alcohol for industrial purposes. In this connection he read two important papers before the Society of Chemical Industry in 1903-4, and was a member of a Departmental Committee held in 1905 to investigate the whole question of industrial alcohol.

He was President of the British Pharmaceutical Conference for 1906-7; was a Fellow of the Institute of Chemistry, a Fellow of the Chemical Society, a past President of the Society of Chemical Industry and Honorary Treasurer until his death, and a member of the Association of British Chemical Manufacturers. He was also managing director of the firm of Thomas Tyrer and Co., Ltd., of Stratford, which was founded in 1884.

Mr. Tyrer played an important part in the development of Cellon Dope from 1912 onwards. His co-directors speak of him as an exceptionally lovable man, and as one who was particularly conscientious in awarding credit where it was due, an attribute worthy of all praise.





# AIRCRAFT MANUFACTURING COMPANY———LIMITED

Contractors to  
War Office and Admiralty .

London Office

27, BUCKINGHAM GATE, S.W.1.

Offices & Works

HENDON, N.W.9.



## Co-operative Research.

THE MEANS OF ORGANISING AND FINANCING AERONAUTICAL RESEARCH, AND THE ADVANTAGES LIKELY TO ACCRUE TO THE AIRCRAFT INDUSTRY FROM CO-OPERATIVE ACTION.

### BY "DIOGENES."

#### FUNDS AND SUBSCRIPTIONS.

When an Industry contemplates embarking on Co-operative or Joint Research the first question to be settled, nowadays, is whether the Industry should work on lines of its own, or whether it should fall in with the broad outline of the Government scheme as framed by the Research Department. Unless the circumstances are very exceptional indeed, it is almost inevitable that full consideration will lead to the adoption of the second course.

The main reason for this is undoubtedly connected with that very important subject, Finance. The essence of the Government scheme is that joint research by a British Industry benefits not only that industry but the community as a whole; therefore a part of the cost must be paid by the Industry and a part by the community. In the case of Aircraft the soundness of this principle is perfectly apparent.

#### GOVERNMENT CONTRIBUTIONS.

In practice it results in the general adoption of a scheme under which, when an Industry establishes a Research Association, the Government subscribes through the Research Department a sum which bears a direct relation to the total subscription of the manufacturers by whom the Association is formed. The relations between the Government's and the manufacturers' subscriptions vary in different cases. Some industries will doubtless secure more generous treatment than others. The most generous treatment of all should evidently be accorded to "key" industries, or to industries upon which the welfare or the safety of the country is directly dependent. Moreover, one would expect that the support given to a young and rapidly developing industry, in connection with which research is obviously needed, would be greater than that offered to an established industry with very large financial reserves.

Thus all the evidence is such as to lead one to the conclusion that the Aircraft Industry would in this matter get as good treatment as anybody. The best that the Research Department ever offers is to put up one pound for every pound subscribed by manufacturers, up to some agreed limit, above which the Government contribution is slightly less lavish, for the reason that the Research Department has only a limited fund at its disposal, and this fund, which consists of £1,000,000, has to last for five years.

#### THE BENEFIT OF SELF-HELP.

There is another point which influences the Government's subscription. This is the question of whether the Industry concerned goes into the matter whole-heartedly. If the Industry were to put up say £8,000 as the annual income of a Research Association in the first instance, with the avowed intention of increasing this amount as time went on, either by the inclusion of new firms or by an increase in subscriptions, then it would be clear evidence that the Industry took the matter seriously and meant business.

The Government would probably double the first £8,000, increasing the annual income to £16,000. If the subscriptions rose the Government might, for every £1,000 added, put up perhaps £750 up to an additional £6,000, and afterwards £500.

Thus, if the manufacturers' subscription rose to £14,000, the Government's subscription might amount to £12,500, making a total of £26,500; if the manufacturers' rose to £20,000, the Government's might amount to £15,500, making a total of £35,500 per annum. These figures must not be taken as representing any exact guarantee of support by the Research Department, but they may probably be taken as a very fair indication of what would be offered to the Aircraft Industry.

#### PROPORTIONAL SUBSCRIPTIONS.

Assuming that it was decided to go into the matter of Joint Research on about the scale indicated, and that, let us say, 40 firms participated in the first instance, these 40 firms would have to make themselves responsible for providing £8,000 per annum, or an average of £200 per annum apiece. This brings us to the point of considering on what arrangement the subscriptions would have to be based.

Every firm might, of course, pay the same amount, but this would be unfair to the smaller concerns, since the value of the results of Research are directly proportional to the individual firm's output, throughout which those results can make themselves evident. Thus we are led to the conclusion that the subscriptions ought to bear some fairly definite relation to output.

Perhaps, in one fairly homogeneous industry, the best way of securing this result would be to base the subscriptions upon the wages paid. Rates under this heading already have to be prepared annually by every firm that is a member of the Engineering Employers' Federation, and these same figures could be utilised.

At the same time, it might be well to put both maximum and minimum limits upon subscriptions.

Probably our average would be secured if the minimum were £50 per annum, and the maximum £600 or £800 per annum. Let us take the former figure as a basis for further reckonings, and assume that all intermediate subscriptions are arrived at by charging so many shillings per £100 of wages paid, the exact number of shillings being estimated to secure the result at which we are aiming. We now have a maximum liability for any firm amounting to £600 per annum. This may look a considerable figure.

#### OUT-OF-POCKET EXPENSE.

We come now, however, to the next important point in the arrangements made by the Government, and it should be noticed that this arrangement is only in respect of annual subscriptions and not of donations or entrance fees.

The arrangement is that the Treasury has agreed to allow these subscriptions to be regarded as working expenses, and therefore to be paid out of income before the income is assessed for Income Tax, Excess Profits, or Controlled Firms' Duties. Roughly speaking, any firm that has grown considerably since the outbreak of war is paying away approximately 80 per cent. of its so-called excess profits in some form or other of taxes.

Thus a firm which declined to subscribe £600 a year to a Research Association would not be able to distribute the whole of that amount among its shareholders. Something like £500 of it would go to the Government. On a basis of 80 per cent., the amount would be £480, leaving a balance of £120. This £120 is therefore the only real out-of-pocket expense which would be involved for the time being by subscribing to a Research Association upon the scale suggested.

Even this would apply only to the biggest firms. The out-of-pocket expenditure of the smallest firms would only be about £10 per annum, assuming that they are now controlled or making excess profits. Of the whole £8,000 subscribed by manufacturers, all but about £1,600 would have gone in taxation had it not been so subscribed.

Consequently the net result under present conditions is, apparently, that to secure an income of £16,000 for a Research Association, the industry need only take £1,600 per annum out of its own pocket and the Government will do the rest.

At this point it should be mentioned that under ordinary circumstances the Research Association would not pay Income Tax on any temporary excess of income over expenditure, so that the offer made by the Government is in reality what it appears to be, and is not merely a subterfuge designed to get your money in a different way.

#### THE GOVERNMENT'S SHARE.

It should be particularly observed that all the offers made by the Government apply only if the financial assistance given by manufacturers to Research takes the form of an annual subscription, guaranteed for a period of years—five years being the general period contemplated.

This means that any proposal to run a Research Association by forming a special fund to pay for each specific research would not be approved by the Department. What is wanted is a more permanent organisation and not a series of experiments such that if the first one or two were unproductive the Industry would lose heart and drop the whole idea.

It should also be noticed that while the subscription by manufacturers would, as explained above, be very trifling for the time being, the ultimate liability is not so small. When firms are no longer controlled and excess profit taxation ceases, the out-of-pocket expenditure by manufacturers will automatically increase.

On the basis mentioned above, and assuming income tax at 5s. in the £, the out-of-pocket expenditure of the largest firms would then be £450 per annum, and of the smallest firms about £40 per annum. Even so, out of an income say of £16,000, the Government would in effect be paying £10,000.

#### CAPITAL ADVANCES.

Moreover, if, for the establishment of a big laboratory, or some other good reason, capital expenditure is necessitated on a scale which would make the ordinary income inadequate for the first year or so, the Research Department will consider advancing its subscription for two or more years, so as to make the initial outlay possible.

The whole scheme is based on the belief that at the end of about five years progressive British industries will have become so firmly convinced of the immense value of Joint Research that they will be prepared to continue to finance it without any assistance. This seems probable, but for the moment we need not perhaps look quite so far ahead.

(To be continued.)



IMPERIAL HOUSE,  
KINGSWAY, W.C. 2.

*FEBRUARY 18th, 1918.*

ON FEBRUARY 25th INST.

— AND —

**For the Duration**

.. OF THE WAR ..

OR THE AIR MINISTRY

OUR ADDRESS WILL BE

**SELSDON AERO & ENG. CO., Ltd.**

**1, ALBEMARLE ST.,**

**PICCADILLY — W.1.**

'Phone : REGENT 1181.

'Grams : "SELAERO, PHONE, LONDON."



**NON-POISONOUS  
DOPE**

**TITANINE**



THE  
**BRITISH AEROPLANE  
VARNISH CO., LTD.**  
166, PICCADILLY, LONDON, W.1

Telephone . . . . . GERRARD 2312.  
Telegrams . TETRAFREE, PICOV. LONDON.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



**WOODSIDE ENGINEERING COMPANY, LTD.,  
POSSILPARK, GLASGOW.**

---

# **AEROPLANE TIERODS**

: IN :

**STREAMLINE AND ROUND SECTIONS**

COMPLETE WITH

**UNIVERSAL OR FORK JOINTS**

**LARGE STOCKS.**

---

**PROMPT DELIVERY.**

---

**Telephones.**

**WORKS: 1495 Douglas (2 lines.)**

**OFFICE: 3456 Central (3 lines.)**

(Private Branch Exchange.)

**Telegrams: "FUSELAGE," GLASGOW.**

**Registered Office**

**50 WELLINGTON STREET,  
GLASGOW.**



# The "Guardian Angel" Parachute



## THE UNWRITTEN STORY OF A GREAT AIR FIGHT

UNDER the above Heading THE SUNDAY HERALD of the 17th inst. publishes the photographs of Lieut. Bishop, R.F.C., of Highbury, N., and of his Observer, Lieut. Douglas Mackintosh, R.F.C., of Brighton, who fought seven German Airmen, until their machine fell in flames, although they might easily have escaped. A photograph of the remains of their machine is also reproduced, sent to THE SUNDAY HERALD by a Belgian lady, who wrote: "The German Pilot, who claimed the victory, descended close to the spot, and said, 'What a pity such heroes should have to die! They could have escaped, but preferred to fight to a finish. Never have I seen such gallant resistance before!' The two heroes were buried with military honours."

Had their machine been fitted with "Guardian Angel" Parachutes, it is a practical certainty that, after their machine had been fired and further fighting on their part made an impossibility, those two very gallant Flying Officers could have escaped, and their lives would have been saved.

### SPECIAL NOTICE TO FLYING OFFICERS.

A number of different types of "Guardian Angel" Parachutes, each one possessing characteristics designed to render it the more suitable to the widely differing requirements of Observation Balloons, Airships, and the various types of Aeroplanes and Seaplanes—but all of them preserving the indispensable features of automatic opening, and static and kinetic control—will shortly be available for the use of the British and Allied Air Services.

*RELIABILITY—First.*

*RELIABILITY—Second.*

*RELIABILITY—ALL THE TIME.*

**E. R. CALTHROP'S AERIAL PATENTS, LTD.**

ELDON STREET HOUSE, ELDON STREET, LONDON, E.C.2.

Telephones (2 lines): London Wall 3266 and 3267.

Telegraphic and Cable Address: "Savemalivo-Ave-London."

**Contractors to the Admiralty and Air Board.**



## THE CENTRAL AIRCRAFT COMPANY

**DESIGNERS AND CONSTRUCTORS  
OF AIRCRAFT.**

**Office and Works:**

**KILBURN, N.W.6.**

**Telegrams: Aviduction, Phone, London.**

**Telephone: Hampstead 4403, 4404.**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# WARING & GILLOW LTD

**CONTRACTORS  
TO THE  
WAR OFFICE AND ADMIRALTY.**  
**LIVERPOOL      HAMMERSMITH      LANCASTER**



**HEAD OFFICE  
OXFORD STREET  
W.1**

**TELEPHONE No.:  
HAMMERSMITH 1980**

**TELEGRAMS:  
"Warings Factories, Hammersmith."**

# NIEUPOORT AND GENERAL AIRCRAFT COMPANY, LTD.


**CONTRACTORS TO H.M. GOVERNMENT.**

**OFFICE AND WORKS—  
LANGTON ROAD,  
CRICKLEWOOD, LONDON, N.W.2**

**TELEPHONE (3 LINES)—  
WILLESSEN 2455**

**TELEGRAMS—  
NIEUSCOUT, CRICKLE, LONDON**





# Non Flame Celluloid

Phone Central 1306 &amp; 1307

Telegrams GREENBERG LONDON

**GREENHILL & SONS**  
**8 WATER LANE LUDGATE HILL**  
**LONDON. E.C. 4**

## Urgent Requirements.

### MATERIAL WANTED.

Offers required for the following:—

PLYWOOD,  $\frac{1}{16}$ ",  $\frac{3}{32}$ ",  $\frac{1}{8}$ ",  $\frac{1}{4}$ ",  $\frac{3}{8}$ ",  $\frac{1}{2}$ ",  $\frac{3}{4}$ "

ALL TYPES OF METAL FITTINGS,

ALUMINIUM DIE CASTINGS,

and HOT BRASS STAMPINGS

for AVRO 504 J Biplanes.



**THE GRAHAME-WHITE AVIATION CO., LTD.,**  
**AERONAUTICAL ENGINEERS.**

### NOTICE

To DeH.6. Contractors.

We can supply *ex* STOCK  
 BLANKINGS for all Metal Parts  
 and AXLES complete.

Special developments of the following:—

Parts Nos. 9485 } Three blankings per set.  
 " " 9488 }

Telephone:—Kingsbury 120 (5 lines).

Telegrams:—Volplane, Hyde, London.

**THE LONDON AERODROME, HENDON, N.W.9**

Proprietors of the London Aerodrome and the Grahame-White School of Flying.



# HANDLEY PAGE LTD.

CONTRACTORS TO  
THE ADMIRALTY  
AND WAR OFFICE

CRICKLEWOOD,  
HAMPSTEAD 7500 (9 lines), LONDON, N.W.2. "HYDROPHID, CRICKLE," LONDON

Contractors to H.M. Admiralty, War Office and Foreign Governments.

## The BRITISH CAUDRON CO., LTD.

SOLE BUILDING AND SELLING RIGHTS FOR

**Caudron Aeroplanes  
and Hydro-Aeroplanes**  
FOR  
**THE BRITISH EMPIRE AND DEPENDENCIES**

*Head Office and Works:*

**BROADWAY, CRICKLEWOOD, N.W.2.**

Cable and Telegraphic Address: "CAUDROPLAN, CRICKLE, LONDON."

Phone: 4647  
4648 HAMPSTEAD

*Scottish Factory and Aerodrome:*

**ALLOA.**

Cable and Telegraphic Address: "CAUDROPLAN, ALLOA."

Phone: 52





# The Aeroplane

## Acceptance and Experimental Flights—

The Procter Isaac Aviation Co. "Aeromina,  
Piccy, London. Gerrard 278 (2 lines).

## Acetylene Welding Plant—

Acetylene Corporation of Great Britain, Ltd.,  
The, 49, Victoria Street, Westminster,  
S.W.1. "Flamma, Vic, London." Vic 4840.  
Imperial Light, Ltd., 123, Victoria Street, London,  
S.W.1. "Edibrac, Phone, London."  
3540 Victoria (3 lines).

## Aeroplane Manufacturers—

Aircraft Manufacturing Co., Ltd., Hendon.  
"Airmanship, Hyde, London."

Armstrong, Sir W., Whitworth & Co., Ltd.,  
Newcastle-on-Tyne. "Armstrong Aviation,  
Newcastle-on-Tyne." Gosforth 500.

Blackburn Aeroplane & Motor Co., Ltd.,  
Olympia, Leeds. "Propellers, Leeds."  
Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane Works,  
Norwich. "Aviation, Norwich." Norwich 851.

British & Colonial Aeroplane Co., Ltd. (The  
Bristol Co.), Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British Caudron Co., Ltd., Broadway, Crickle-  
wood, N.W.2. "Caudronplan, Crickle-  
wood, N.W.2." Hampstead 5551.

Central Aircraft Co., Palmerston Works, High  
Road, Kilburn, N.W.6. "Aviduction,  
Phone, London." Hampstead 4403 and 4404.

Davidson Aviation Co., Ltd., Hammersmith,  
W.6. Hammersmith 1144-1145.

Eastbourne Aviation Co., Ltd., Eastbourne.  
"Aircraft, Eastbourne." Eastbourne 1176.

Graham-White Aviation Co., Ltd., London  
Aerodrome, Hendon. "Volplane, Hyde,  
London." Kingsbury 120.

Handley Page, Ltd., 110, Cricklewood Lane,  
N.W.2. "Hydrophil, Crickle, London."  
Hampstead 7420.

Hooper & Co., Ltd., 54, St. James St. Picca-  
dilly, London, S.W. "Sociable, St. James,  
London." Regent 012.

Mann, Egerton & Co., Aircraft Works, Nor-  
wich. "Motors, Norwich." Norwich 482 (4 lines).

Martinsyde, Ltd., Brooklands, Byfleet.  
"Martinsyde, Weybridge." Woking 331; Byfleet 171.

National Aircraft Co., Ltd., 15, Hackney Road,  
N.E.2. London Wall 6725.

"Nieuport" & General Aircraft Co., Crickle-  
wood, London, N.W.2. "Nieu Scout,  
Crickle, London." Willesden 2455.

Norman-Thompson Flight Co., Ltd., Bognor.  
"Soaring, Bognor." Bognor 48.

The Regent Carriage Co., Ltd., 126/132, New  
King's Road, Fulham, S.W.6. "Carbodus,  
London." Putney 2240-2241.

Roe, A. V., & Co., Ltd., Manchester. "Tri-  
plane, Manchester." City 8530-8531, Manchester.

Saunders, S. E., Ltd., East Cowes, I.O.W.  
"Consuta, East Cowes." Cowes 193.

Short Bros., Rochester, Eastchurch and  
Whitehall House, S.W. "Tested, Phone  
London." Regent 378.

Sopwith Aviation Co., Ltd., Kingston-on-  
Thames. "Sopwith, Kingston." Kingston 744.

Standard Aircraft Manufacturing Co., Effing-  
ham House, Arundel Street, W.C.2.  
"Gunsignrush, Estrand, London." City 89.

Vickers, Ltd., Imperial Court, Basil Street,  
Knightsbridge, S.W.3. "Vickerflyta,  
Knights, London." Kensington 6810.

Waring & Gillow, Ltd., Hammersmith.  
"Warisen, Ox, London." Museum 5000.

Westland Aircraft Works, Yeovil. "Aircraft,  
Yeovil." Yeovil 129.

White, J. Samuel, & Co., Ltd., East Cowes.  
"White, East Cowes." Cowes 3.

Whitehead Aircraft (1917), Ltd., Richmond Sur-  
rey. "Whitcraft, Richmond, Surrey." Richmond 1865.

Wycombe Aircraft Constructors, Ltd., High  
Wycombe, Bucks. "Aircraft, High  
Wycombe." High Wycombe 84.

## Airships—

Airships, Ltd., High Street, Merton.  
Wimbledon 1314.

Short Bros., Rochester, Eastchurch, and White-  
hall House, S.W. "Tested, Phone, Lon-  
don." Regent 178.

## Aluminium Castings (Sand & Die)

Coan, R. W., 219, Goswell Road, London,  
E.C.1. "Krankases, Isling, London." City 7846.

## Bearings (Etonia Cast Phosphor Bronze)—

Yorkshire Engineering Supplies, Ltd., Wortley,  
Leeds. "Yes, Leeds." Central 3927.

## Brass Sheets for Tipping Pro-pellers—

Pritt & Co., 46, Fenchurch Street, London,  
E.C.3. "Poetry, Fen, London." Avenue 995, 996, and 7006.

## Buildings—

Boulton & Paul, Ltd., Rose Lane Works,  
Norwich. "Aviation, Norwich." Norwich 851.

Palmer, T. W., & Co., Church Road, Merton  
Abbey, Surrey. Wimbledon 1313.

Rubery Owen & Co., Darlaston, South Staffs.  
The Wilfley Co., Ltd., Salisbury House, London,  
W.1. "Wrathless, Phone, City 269."

## Cable Coverings and Cable

Herbert Terry & Sons, Ltd., Redditch.  
"Springs, Redditch." Redditch 61.

## Capstan Work—

Gabriel & Co., 4 and 5, A B Row, Birming-  
ham. "Gabriel, Birmingham." Central 1223.

## Carburettors—

Hobson, H. M., Ltd., 29, Vauxhall Bridge  
Road, S.W.1. Victoria 4670.

## Casein—

Nieuwhof, Surie & Co., Ltd., 5, Lloyds  
Avenue, London, E.C.3. "Surico don, Fen  
London." Avenue 34 and 35.

## Castings—

Gabriel & Co., 4 and 5, A B Row, Birming-  
ham. "Gabriel, Birmingham." Central 1223.

## Castings (Aluminium, Brass,

Bronze, Machined or Rough)—  
Gabriel & Co., 4 and 5, A B Row, Birming-  
ham. "Gabriel, Birmingham." Central 1223.

## Celluloid (Non-Flam.)—

Greenhill & Sons, 8, Water Lane, E.C.  
"Greenberg, London." Central 1306-7.

London Label Co., Beckton Road, E.16. "Lon-  
label, Canning, London." East 1300.

## Clothing—

Burberry's, Ltd., Haymarket, S.W.1.  
Regent 2165.

Dunhill's, Ltd., Euston Road, N.W.1. "Dun-  
send, London." North 3405-6.

## Component Parts—

Accles & Pollock, Ltd., Oldbury, Birmingham.  
"Accles, Oldbury." Oldbury 111 (4 lines).

B. D. V. Aircraft Spares, Syon Chambers,  
16a, Kew Road, Richmond, Surrey. "Aeros,  
Richmond." Richmond 168.

Central Aircraft Co., Palmerston Works,  
High Rd., Kilburn, N.W.6. Hampstead, 4728.

"Aviduction, Phone, London."

Evans, Joseph, & Co., Ltd., Liverpool Street  
Mills, Birmingham. "Adept, Birming-  
ham." Central 733 (3 lines).

The Aircraft Construction Co., Harley Works,  
Beckton Road, E.16. "Aeracracons, Can-  
ning, London." East 1300.

Thompson Bros. (Bilston), Ltd., Bradley, Bil-  
ston, England. "Thompson Bros., Bilston."  
Bilston 10.

## Cords, Tapes, and Threads—

MacLennan, J., & Co., 30, Newgate Street,  
E.C.1. And at Glasgow. City 3115.

## Dopes—

British Aeroplane Varnish Co., Ltd., 166, Picca-  
dilly, W.1. "Tetrafree, Piccy, London." Gerrard 2312.

British Cellulose Co., 8, Waterloo Place, S.W.1.  
"Cellutate, London." Regent 4046.

The British Emallite Co., Ltd., 30, Regent  
Street, S.W.1. "Ridleyren, Piccy, Lon-  
don." Gerrard 280.

Cellon, Ltd., Broad Street House, New Broad  
Street, E.C.2. "Ajawb, London." London Wall 5350-5622.

Clark, Robert, Ingham & Co., Ltd., Walter  
House, Bedford Street, Strand, W.C.  
"Pearline, Westrand." Regent 3923.

## Electrical Accessories—

Belling & Co., Derby Road Works, Montague  
Road, Upper Edmonton, N.18. "Belling,  
Edmonton." Tottenham 1984.

Johnson & Phillips, Ltd., Charlton, London,  
S.E.7. "Juno, London." Central 2207, London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland  
Street, London, W.1. "Installing, Eus-  
road, London." Museum 70.

Premier Electric Heaters, Ltd., 258, 259, and  
360, Bradford Street, Birmingham. "Fah-  
renheit, Birmingham." Midland 681.

The Rotax Motor Accessories Co., Ltd., Victoria  
Road, Willesden Junction, N.W.10.  
"Rodynalite, Phone, London." Willesden 2480.

## Electric Cables—

E. Kalker & Co., Coventry. "Kalker, Coven-  
try." Coventry 248.

Johnson & Phillips, Ltd., Charlton, London,  
S.E.7. "Juno, London." Central 2207, London Wall 1564.

## Electric Lighting and Power—

E. Stanley Fardon, A.M.I.E.E., 67, Mosley  
Street, Manchester.

Johnson & Phillips, Ltd., Charlton, London,  
S.E.7. "Juno, London." Central 2207, London Wall 1564.

## Engines and Parts—

Allen, W. H., Son & Co., Ltd., Queen's En-  
gineering Works, Bedford. "Pump, Bed-  
ford." Bedford No. 1.

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dum-  
fries." Dumfries 281-282.

The Beatty School of Flying, Ltd., The Broad-  
way, Cricklewood, N.W.2. Hampstead 3000.

Beardmore Aero Eng., Ltd., 112, Great Port-  
land Street, W.1. "Beardmore, London." Gerrard 238.

Dudbridge Iron Works, Ltd. (Salmson), 87,  
Victoria Street, London S.W.1. "Aero-  
flight, Vic, London." Vic 7026.

Evans, Joseph, & Co., Ltd., Liverpool Street  
Mills, Birmingham. "Adept, Birming-  
ham." Central 733 (3 lines).

Gordon Watney & Co., Ltd., Weybridge.  
"Mercedex, Weybridge." Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham.  
Richmond 1943.

Gwynnes, Ltd., Hammersmith Iron Works,  
Hammersmith, W. "Gwynne, Ham-  
mersmith." Hammersmith 1010.

Napier & Son, D., Ltd., 14, New Burlington  
Street, London, W., and at Acton, W.  
"Nitrifier, London." Gerrard 826.

Robertson, J. H., & Co., 1, Albemarle Street,  
London, W.1. Regent 3006.

Rolls-Royce, Ltd., 14 and 15, Conduit St., W.1.  
"Rollhead, London." Gerrard 1644-4.

The Selsdon Aero & Engineering Co., Ltd.,  
Imperial House, Kingsway, W.C.2. Regent 1181.

Sturtevant, B. F., Co., Ltd., Hyde Park, Boston,  
U.S.A. "Moorfield, Wolverhampton." Wolverhampton 085.

Sunbeam Motor Car Co., Ltd., Wolverhampton.  
"Moorfield, Wolverhampton." Wolverhampton 085.

The Gnome & Le Rhône Engine Co., Ltd.,  
47, Victoria Street, S.W. "Elevenfold,  
London." Walthamstow 408 (2 lines).

## Flare Lights—

Imperial Light, Ltd., 123, Victoria Street, Lon-  
don, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

## Flexible Shafts—

Herbert Terry & Sons, Ltd., Redditch.  
"Springs, Redditch." Redditch 61.

## Flying Schools—

Bournemouth Aviation Co., Ltd., Talbot Vil-  
lage, Bournemouth. "Etches, Winton." Bournemouth 1160.

Cambridge School of Flying and Aerodrome Co.,  
308, St. Andrews St., Cambridge. "Car-  
bon, Cambridge." Cambridge 5 and 1086.

## Furniture (Office)—

Cooke's (Finsbury), Ltd., Finsbury Pavement  
House, London, E.C.2. London Wall 573 and 6179.

## Galvanising—

Boulton & Paul, Ltd., Rose Lane Works,  
Norwich. "Aviation, Norwich." Norwich 851.

The Rustless Iron (Cowper Coles Process),  
Ltd., 1, French St., Sunbury-on-Thames,  
Middlesex. Sunbury 37.

## Gears—

Moss Gear Co., Ltd., Thomas Street, Aston,  
Birmingham. "Mosgear, Birmingham." East 407.

## Glue—

Central Chemicals, Ltd., 283, West End Lane,  
London, N.W.6. "Entramical, Westham-  
p, London." Gt. Hermitage Street, E. (Croid.) Avenue 3178.

Improved Liquid Glues Co., Ltd., Gt. Hermitage  
Street, E. (Croid.) Avenue 3178.

Mendine Co., 8, Arthur Street, E.C. Bank 5873.

Oldroyd, Wm., & Sons, Ltd., 9, Mincing Lane,  
E.C.3.

## Goggles—

Triplex Safety Glass Co., Ltd., 1, Albemarle  
Street, Piccadilly, W.1. "Shatterlys, Piccy,  
London." Regent 1340.

## Heating and Ventilating—

Chas. P. Kinnell & Co., Ltd., 65 & 65a  
Southwark Street, London, S.E.1. "Kinnell,  
London." Hop 372 (2 lines).

## Hollow Spars—

McGruer Bentwood Hollow Spar Co., Com-  
mercial Wharf, Lameth, S.E. "Gabriel-  
son, Watloo, London." Hop 718.

Robert Young's Construction Co., Ltd., Canon-  
bury Works, Canonbury Street, Essex Rd.,  
London, N.1.

## Instruments—

British Wright Co., Ltd., 33, Chancery Lane,  
W.C.2. Holborn 1308.

## Instruments (Scientific, Alti-

mers, etc.)—  
The Cambridge Scientific Instrument Co., Ltd.,  
Cambridge. "Instrument, Cambridge." Cambridge 642.

Short & Mason, Ltd., Macdonald Road,  
Walthamstow, E.17. "Aneroid, Phone,  
London." Walthamstow 180.



# Buyers' Guide.



## Machine Tools—

Brewster & Co., 11, Queen Victoria Street, E.C.4. "Circumfuse, Cannon, London." City 768.

## Magneto Driving Pieces—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Magnetos—

The M-L Magneto Syndicate, Ltd., Victoria Works, Coventry. "Corlton, Coventry." Coventry 1008-1009.

The British Lighting & Ignition Co., Ltd., 204, Tottenham Court Road, W.1. "Vicks mag, Phone, London." Museum 430.

Ericsson Manufacturing Co. (Berling Magneto), Buffalo, N.Y., U.S.A.

## Metal Manufacturers—

Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 42-43.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

## Metals in General—

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Pritt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fen, London." Avenue 905, 906, and 7006.

Samuel Mercer & Co., 198, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

## Metal Parts and Fittings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

Aircraft Supplies Co., Ltd., Ascot House, 125, Long Acre, W.C.2. "Upcast, Rand, London." Gerrard 276 (2 lines).

Arnott & Harrison, Ltd., Hythe Road, Willesden Junction. Willesden 2207.

Bayliss, Jones & Bayliss, Ltd., Wolverhampton. (Bolts and Nuts.) "Bayliss, Wolverhampton." Wolverhampton 1041.

The Birmingham Guild, Ltd., 45, Gt. Charles Street, Birmingham. "Handicraft." Central 3705.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

The British Gold Shell Ring Co., Ltd., Inverness Road, Hounslow, London. "Golshe, Hounslow." Hounslow 254.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Euston, London." Museum 70.

Mountford, Fredk., Ltd., Fremo Works, Lifford, Birmingham. "Fremo, Birmingham." Kings Norton 261.

Robertson, J. H., & Co., 1, Albemarle Street, London, W.1. Regent 3906.

Rubery, Owen, & Co., Darlaston South Staffs.

Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66.

The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulvipult, Phone, London." Holborn 410.

The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. Regent 1181.

The Aircraft Construction Co., Harley Works, Beckton Road, E.16. "Aeracracons, Canning, London." East 1300.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Ltd." Bilston 10.

Wooler Engineering Co., Ltd., Old Oak Common Lane, Willesden Junction, N.W.10.

## Metal Shearing Tools—

Montgomery, Smith, & Co., Ltd., Tangent Works, Keynsham, near Bristol. "Ingenuity, Salford." Keynsham 21.

## Metal Spinnings—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Metric Bolts—

Cashmore Bros., Zota Works, Hildreth Street, Baltham, S.W. Battersea 415.

Rubery Owen & Co., Darlaston, South Staffs.

## Miscellaneous—

Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast." Belfast 4033-4034-4035.

Anti-Glare Glass Co., Ltd., 30, Wigmore Street, "Wingateise, London." Mayfair 2553.

Bowden Wire, Ltd., Willesden Junction, "Bowirelim, Harles, London." Willesden 2400 (3 lines).

British Metal (Kingston), Ltd., Kingston-on-Thames.

Brown Bros., Ltd., Great Eastern Street, E.C.1. "Imbrowned, Bethroad, London." London Wall 6300.

Herbert Frood Co., Ltd., Chapel-en-le-Frith. "Frodobake, Birmingham." Central 793.

Endolithic Manufacturing Co., Ltd., 61½, Fore Street, London, E.C.2. Labels in Metal, Ivory, Ivorine, etc.

Glasso Manufacturing Co., Ltd., 211, City Road, E.C. City 9558.

London Label Co., Ltd., Harley Works, Beclton Road, E.16. "Nonflamoid" Nonflammable Celluloid. "Lonlabel, Canning, London." East 1300.

MacLennan, J., & Co., 30, Newgate Street, E.C.1, and at Glasgow. Tapes, Cords and Threads. City 3115.

## Motor Cars—

Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

Mann, Egerton & Co., Ltd., 379/381, Euston Road, London, N.W.1. "Manegear, Euston, London." Museum 70.

Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 530 (4 lines).

## Nameplates and Labels—

British Metal (Kingston), Ltd., Kingston-on-Thames.

Endolithic Manufacturing Co., Ltd., 61½, Fore Street, London, E.C.2.

The Clegg Metal Engraving Co., Chatsworth Works, Worthing. "Clegg Worthing."

## Observation Panels—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlyss, Piccy, London." Regent 1340.

## Parachutes—

E. R. Caithrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemaivo, Ave, London." London Wall 3266-3267.

## Pattern Making—

Fredk. Ward, 6, 7 and 8, Allsop Street, Upper Baker Street, W. Padd 4743.

## Piston Rings—

British Chuck & Piston Ring Co., Coventry. "Rings, Coventry." Coventry 723.

## Power Presses and Dies—

Bliss, E. W., & Co., 23, Pocock Street, Blackfriars Road, London, S.E.1. "Blissdon, London." Hop 4340.

## Presswork—

Rubery Owen & Co., Darlaston, South Staffs. Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Propellers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames. "Ebora, Kingston." Kingston 672.

Integral Propeller Co., Ltd. "Avirop, Hyde, London." Hendon 9. Kingsbury 104.

Lang Propeller, Ltd., Weybridge. "Acrosticks, Weybridge." Weybridge 520-521.

Mann, Egerton & Co., Ltd., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Oddy, W. D., & Co., Leeds. "Aircscrews, Leeds." Central 291, Leeds.

Stanley Aviation Co., 67, Kingsland Road, E.2. City 8347.

Westland Aircraft Works, Yeovil. "Aircraft, Yeovil." Yeovil 129.

## Pyrometers—

The Foster Instrument Co., Letchworth, Herts. Foster Instruments, Letchworth. Letchworth 26.

## Rigging for Aircraft—

Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466 (3 lines).

## Rubber Tubing & Accessories—

Hancock, James Lyne, Ltd., 266, Goswell Road, London, E.C.1. "Masticator, Isling, London." City 3811 and 3812.

## Safety Belts—

Holmes, C. H., & Son, 38, Albert Street, Manchester. "Semloh, Manchester." City 4432.

## Screw-driving Machines—

Russell Bros. (Redditch), Ltd., Littleworth, Redditch. "Inventors, Redditch." Redditch 74.

## Seaplane Manufacturers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

Mann, Egerton & Co., Ltd., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

The Norman Thompson Flight Co., Ltd., Middleton, Bognor. "Soaring, Bognor." Bognor 48.

Short Bros., Rochester. "Seaplanes, Rochester." Chatham 627.

Supermarine Aviation Co., Ltd., Southampton. "Supermarine, Southampton." Southampton 1337.

## Searchlights and Landing Lights—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibruce, Phone, London." 3510 Victoria (3 lines).

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

## Seats for Aeroplanes—

Bowser, E., Art Cane Works, 50 Park Lane, Leeds. Central 3473.

## Shackles—

The British Gold Shell Ring Co., Ltd., Inverness Road, Hounslow. "Golshe, Hounslow." Hounslow 254.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

## Sheet Metal Pressings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

Blackburn Aeroplane and Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345.

W. H. Briscoe & Co., Ltd., 51 and 52, Park Street, Birmingham. "Brisk, Bham." Central 550.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

London Aluminium Co., Ltd., Westwood Road, Aston, Birmingham. East 497 Birmingham.

Rubery Owen & Co., Darlaston, South Staffs.

## Sheet Metal Work—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4870.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Rubery Owen & Co., Darlaston, South Staffs.

The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4870.

The Selsdon Aero & Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. Regent 1181.

Arthur Hill & Co., Silchester Road, North Kensington, W. Park 1443.

## Shock Absorbers (Elastic Cord)—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Sparking Plugs—

Lodge Sparking Plug Co., Ltd., Rugby. "Igniter, Rugby." Rugby 245.

Ripault, Leo, & Co., Ltd. (Oleo Plugs), 64a, Poland Street, W.1. "Ripault, Reg, London." Gerrard 7758.

## Springs—

Dart Spring Co., West Bromwich. "Dart, West Bromwich." West Bromwich 322.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61 (3 lines).

## Stampings—

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

## Steel—

Firth, Thos., & Sons, Sheffield. "Firth, Sheffield." Sheffield 3230 to 3237.

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

Nicklin, Bernard, & Co., Birmingham. "Bernico, Birmingham." Smithwick 224.

## Steel Stamps and Markings—

John Meerloo & Sons, Cleveland Works, Cleveland Street, Mile End, E.1. "Dayhur, Phone, London." East 3331 (2 lines).

## Steel Tension Wires—

Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466.

## Steel Tubes for Aeroplanes—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

## Taper Pins—

Mountford, Fredk. (Birmingham), Ltd., Fremo Works, Lifford, Birmingham. "Fremo, Birmingham." King's Norton 261-262.

## Tapes and Smallwares—

Brown, Percy, & Co., 49, Newgate Street, London, E.C.1. "Ominiate, Cent, London." City 4659.

MacLennan, John, & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3175.

James North Hardy & Son, Ltd., 54, Portland Street, Manchester. "Hardson, Manchester." Central 6471.

## Timber—

Engineering Timber Co., Ltd., 9, Victoria Street, London, S.W. "Entikosil, Vic, London." Victoria 5073, 4210.

Brown, R. F., & F. W., Wollaton Saw Mills, near Nottingham. "Brown's Saw Mills, Wollaton." Nottingham 1526.

J. Owen & Sons, Ltd., 109a, Borough High Street, S.E.1. "Bucheron, London." Hop 3811 (2 lines).

## BUYERS' GUIDE cont. on next page.







# The Aeroplane

# Buyers' Guide



## Acceptance and Experimental Flights

The Procter Aviation Co., Ltd., "Aeromina," Pacey, London. Gerrard 278 (1 line).

## Acetylene Welding Plant

Acetylene Corporation of Great Britain, Ltd., The 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 480. Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibac, Phone, London." 350 Victoria (1 line).

## Aeroplane Manufacturers

Aircraft Manufacturing Co., Ltd., Hendon. "Alarmship, Hyde, London." Kingsbury 180.

Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle-on-Tyne. "Armstrong Aviation, Newcastle-on-Tyne." Armstrong Aviation, Gosforth 500.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 531.

British & Colonial Aeroplane Co., Ltd., (The Bristol Co.), Filton, Bristol. "Aviation, Bristol." Bristol 3000.

British Caudron Co., Ltd., Broadway, Cricklewood, N.W.1. "Caudron, Cricklewood, London." Hampstead 3551.

Central Aircraft Co., Palmerston Works, High Road, Kilburn, N.W.6. "Aviation, Phone, London." Hampstead 4103 and 4104.

Davidson Aviation Co., Ltd., Hammersmith, W.6. "Hammersmith 1141-1145.

Eastbourne Aviation Co., Ltd., Eastbourne. "Aircraft, Eastbourne." Eastbourne 1178.

Grabbie-White Aviation Co., Ltd., London. "Aerodrome, Hendon." Velplaine, Hyde, London.

Handley Page, Ltd., 110, Cricklewood Lane, N.W.3. "Hydrophid, Cricklewood, London." Hampstead 7420.

Hooper & Co., Ltd., 54, St. James's Place, London, S.W.1. "Sociable, St. James, London." Regent 312.

Mann, Egerton & Co., Aircraft Works, Norwich. "Motors, Norwich." Norwich 487 (4 lines).

Marlinsay, Ltd., Weybridge, Surrey. "Marlinsay, Weybridge." Woking 331; Blythe 171.

National Aircraft Co., Ltd., 15, Hackney Road, N.E.4. "Aviation, Hackney, London." Regent 312.

"Niropat" & General Aircraft Co., Cricklewood, London, N.W.2. "Niropat, Cricklewood, London." Willesden 2455.

Norman-Thompson Flight Co., Ltd., Bognor. "Bognor, Bognor." Bognor 48.

The Regent Carriage Co., Ltd., 126/127, New King's Road, Fulham, S.W.6. "Carboidis, London." Putney 2240-2241.

Roe, A. V. & Co., Ltd., Manchester. "Triplane, Manchester." City 853-8531, Manchester.

Saunders, S. E., Ltd., East Cotes, I.O.W. "Comute, East Cotes." Cotes 103.

Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tested, Phone, London." Regent 378.

Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston." Kingston 744.

Standard Aircraft Manufacturing Co., Effingham House, Arundel Street, W.C.2. "Guniergair, Estrand, London." City 80.

Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickerly, Knights, London." Kensington 680.

Waring & Gillow, Ltd., Hammersmith. "Warren, & Gillow, Ltd., Hammersmith." Weybridge 3000.

Westland Aircraft Works, Yeovil. "Aircraft, Yeovil." Yeovil 120.

White, J. Samuel, & Co., Ltd., East Cotes. "White, East Cotes." Cotes 103.

Whitehead Aircraft (1917), Ltd., Richmond. "Whitcraft, Richmond, Surrey." Richmond 1865.

Wycombe Aircraft Constructors, Ltd., High Wycombe. "Bucks." High Wycombe 84.

## Airships

Airships, Ltd., High Street, Merio. "Short Bros., Rochester, Eastchurch, and Whitehall House, S.W." Tested, Phone, London. Regent 178.

## Aluminum Castings (Sand & Die)

Coad, R. W., 219, Goswell Road, London, E.C.1. "Krankases, Isling, London." City 186.

## Bearings (Etonia Cast Phosphor Bronze)

Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds." Central 3927.

## Brass Sheets for Tipping Propellers

Pritt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fen, London." Avenue 995, 996, and 7005.

## Buildings

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 531.

Palmer, T. W. & Co., Church Road, Merton Abbey, Surrey. "Wimbledon 1313.

Rumsey Owen & Co., Darlington, South Staffs. "The Wilton Co., Ltd., Salford House, London." Wall, E.C.2. "Wardles, Phone, London." City 267.

## Cable Coverings and Cable Controls

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Capstan Work

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Carburettors

Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.1. "Victoria 4670.

## Casein

Nieuwhof, Suris & Co., Ltd., 5, Lloyds Avenue, London, E.C.3. "Suricodon, Fen, London." Avenue 34 and 35.

## Castings

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Castings (Aluminium, Brass, Bronze, Machined or Rough)

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Celluloid (Non-Flam.)

Greenhill & Sons, 8, Water Lane, E.C. "Greenberg, London." Central 1306-7.

London Label Co., Beckton Road, E.16. "London Label, Canning, London." East 1300.

## Clothing

Burbery's, Ltd., Haymarket, S.W.1. "Regent 2165.

Dunhill, Ltd., Euston Road, N.W.1. "Dunsend, London." North 3405-6.

## Component Parts

Acles & Pollock, Ltd., Oldbury, Birmingham. "Acles, Oldbury." Oldbury 111 (4 lines).

B. D. V. Aircraft Spares, Syon Chambers, 16a, New Road, Richmond, Surrey. "Aeros, Richmond." Richmond 160.

Central Aircraft Co., Palmerston Works, High Rd., Kilburn, N.W.6. "Hampstead 4728.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

The Aircraft Construction Co., Harley Works, Beckton Road, E.16. "Aeraceros, Canning, London." East 1300.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

## Cords, Tapes, and Threads

MacLennan, J., & Co., 30, Newgate Street, E.C.1. "And at Glasgow." City 3115.

## Dopes

British Aeroplane Varnish Co., Ltd., 166, Piccadilly, W.1. "Tetrafree, Piccadilly, London." Regent 2119.

British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellulose, London." Regent 404.

The British Enamelite Co., Ltd., 30, Regent Street, S.W.1. "Ridley, Regent, Piccadilly, London." Regent 280.

Celion, Ltd., Broad Street House, New Broad Street, E.C.2. "Ajabw, London." Regent 3913.

Clark, Robert, Ingham & Co., Ltd., Waller House, Bedford Street, Strand, W.C. "Pearline, Westrand." Regent 3913.

## Electrical Accessories

Belling & Co., Derby Road Works, Montague Road, Upper Edmonson, N.8. "Belling, Edmonson." Tottenham 1084.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "June, London." Central 2207, London Wall 1564.

Mann, Egerton & Co., Ltd., 172, Cleveland Street, London, W.1. "Installing, Euston, London." Regent 378.

Premier Electric Heaters, Ltd., 258, 259, and 360, Broadford Street, Birmingham. "Fah-reh-reh, Birmingham." Midland 181.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

## Electric Cables

E. Kalkor & Co., Coventry. "Kalkor, Coventry." Coventry 215.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "June, London." Central 2207, London Wall 1564.

## Electric Lighting and Power

E. Stanley Fenton, A.M.I.E.E., 67, Mosley Street, Manchester. "Fenton, Manchester." Manchester 100.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "June, London." Central 2207, London Wall 1564.

## Engines and Parts

Allen, W. H., Son & Co., Ltd., "Queen's Engineering Works, Bedford." Bedford 30, 1.

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 181.

The Beaver Club of Flying, Ltd., The Broadway, Cricklewood, N.W.1. "Hampstead 1000.

Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London." Gerrard 37.

Dudbridge Iron Works, Ltd., (Salmon), 17, Victoria Street, London, S.W.1. "Aero, Night, Vic, London." Vic 7026.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

Gordon Watney & Co., Ltd., Weybridge. "Mercedes, Weybridge." Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham. "Hammer-smith, W. Twynne, Hammer-smith." Weybridge 550 (7 lines).

Gwynnes, Ltd., Hammersmith Iron Works, Hammersmith. "Hammer-smith, Weybridge 550 (7 lines).

Napier & Son, D., Ltd., 14, New Burlington Street, London, W.1. "and at Acton, W.1." "Nirifair, London." Gerrard 896.

Robertson, J. H., & Co., 1, Albemarle Street, London, W.1. "Regent 3090.

Rolls-Royce, Ltd., 14 and 15, Conduit St., W.1. "Railroad, London." Gerrard 1467-8.

The Selsdon Aero Engineering Co., Ltd., Imperial House, Kingsway, W.C.2. "Regent 1110.

Sturtevant, B. F., Co., Ltd., Hyde Park, Belfo, U.S.A. "Sunbeam Motor Car Co., Ltd., Wolverhampton." "Merford, Wolverhampton." Wolverhampton 415.

The Gnome & Le Rhône Engine Co., Ltd., 47, Victoria Street, S.W. "Elevenfold, London." Walthamstow 408 (4 lines).

## Flare Lights

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibac, Phone, London." 350 Victoria (1 line).

## Flexible Shafts

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Flying Schools

Bournemouth Aviation Co., Ltd., Talbot Villa, Bournemouth. "Eichen, Winton." Bournemouth 1160.

Cambridge School of Flying and Aerodrome Co., 100, St. Andrews St., Cambridge. "Cambridge, Cambridge." Cambridge 5 and 6179.

## Furniture (Office)

Coolie's (Finsbury), Ltd., Finsbury Pavement House, London, E.C.2. "London Wall 573 and 6179.

## Galvanising

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 531.

The Rustless Iron (Copper Coles Process), Ltd., 1, French St., Sunbury-on-Thames, Middlesex. "Sunbury 370.

## Gears

Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mogear, Birmingham." East 497.

Central Chemicals, Ltd., 283, West End Lane, London, N.W.6. "Entrainical, Westhampton." London. East 1300.

Improved Liquid Glues Co., Ltd., Gt. Hermitage Street, E. (Croyd). "Exocodon, Wapp, London." Avenue 3173.

Medline Co., 8, Arthur Street, E.C. Bank 378.

Oldfield, Wm., & Sons, Ltd., 9, Mincing E.C.3. "Goggles." Tottenham 1084.

Temple Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shat, Regent 1367.

## Heating and Ventilating

Chas. P. Kinnell & Co., Ltd., 65 & 65a, Southwark Street, London, S.E.1. "Kinnell, London." Hop 373 (3 lines).

## Hollow Spars

McGover Bentwood Hollow Spar Co., Commercial Wharf, Lambeth, S.E. "Gabriel, Wotton, London." Hop 218.

Robert Young's Construction Co., Ltd., Canonbury Works, Canonbury Street, Essex Rd., London, N.1. "London, N.1."

## Instruments

British Wright Co., Ltd., 33, Chancery Lane, W.C.2. "W.C.2." Holborn 130.

The Cambridge Scientific Instrument Co., Ltd., Cambridge. "Instrument, Cambridge." Cambridge.

Short & Mason, Ltd., Macdonald Rd., Walthamstow, E.17. "Aneroid, Phone, Walthamstow 180.

## Instruments (Scientific, All-meters, etc.)

The Cambridge Scientific Instrument Co., Ltd., Cambridge. "Instrument, Cambridge." Cambridge.

Short & Mason, Ltd., Macdonald Rd., Walthamstow, E.17. "Aneroid, Phone, Walthamstow 180.

## Machine Tools

Brewer & Co., 11, Queen Victoria Street, London, E.C.4. "Circumfuse, Cannon, London." City 768.

## Magneto Driving Pieces

Harley Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Magnetos

The M.I. Magneto Syndicate, Ltd., Victoria Works, Coventry. "Coventry, Coventry." Coventry 1008-1009.

The British Lighting & Ignition Co., Ltd., 20, Tottenham Court Road, W.1. "Vicks, 1002, Phone, London." Museum 430.

Erickson Manufacturing Co. (Berling Magneto), Buffalo, N.Y., U.S.A. "Museum 70.

## Metal Manufacturers

Childs, Chas., & Sons, Ltd., Birmingham. "Bilford, Birmingham." Central 42-43.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Metal Parts and Fittings

Acles & Pollock, Ltd., Oldbury, Birmingham. "Acles, Oldbury." Oldbury 111 (4 lines).

Aircraft Supplies Co., Ltd., Ascot, Hants. "123, Lane, Acce, W.C.2." "Upstart, Rand, London." Gerrard 276 (4 lines).

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 181.

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 181.</



**The Aeroplane" Buyers' Guide.—continued.****Time Recorders—**

Gledhill-Brook Time Recorders, Ltd., 26, Victoria Street, S.W.1.  
Victoria 1310.

**Turnbuckles—**

Rubery Owen & Co., Darlaston, South Staffs.

**Tyres and Wheels—**

The Palmer Tyre, Ltd., Shaftesbury Avenue.  
"Tyricord, Westcent." Gerrard 1214 (5 lines)

**Undercarriages—**

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston."  
Bilston 10.

**Varnishes—**

The British Emailite Co., Ltd., 30, Regent Street, S.W.1. "Ridleyppren, Piccy, London."  
Gerrard 280.  
Clark, R. Ingham & Co., Walter House, Bedford Street, Strand, W.C. "Pearline, Westrand."  
Regent 3923.  
Harland, W. & Son, Merton, London, S.W.19.  
"Harland, Wimbledon 45."  
Wimbledon 45 and 1395.  
Naylor Bros., Ltd., Southall, Middlesex.  
"Naylor, Southall." Southall 30.

**Vices—**

C. and J. Hampton, Ltd., Sheffield. "Vices, Sheffield."  
Attercliffe 95.

**Washers—**

Avenue 1412.  
Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3.  
Herbert Terry & Sons, Ltd. Redditch.  
"Springs, Redditch." Redditch 61.

**Watchmakers and Jewellers (Silver Models)—**

Goldsmiths' & Silversmiths' Co., Ltd., 112, Regent Street, W.1. Gerrard 0901 (3 lines).

**Welding and Cutting Plant—**

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.  
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London."  
3540 Victoria (3 lines).

**Welding Repairs—**

Barimar, Ltd., 10, Poland Street, W.1. "Bariquamar, Reg, London." Gerrard 8173.  
The New Welding Co., 26, Rosebery Avenue, London, E.C.1. "Windoneeda, Holb, London."  
Holborn 5252.

**Wind Shields—**

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, 'Phone, London."  
3540 Victoria (3 lines).  
Auster, Ltd., 133, Long Acre, W.C. "Winsector, London." Regent 5910.  
London Label Co., Ltd., Hadley Works, Beckton Road, E.16. "Nonflamoid" Nonflammable Celluloid. "Lonlabel, Canning, London." East 1300.

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

**Wire Gauze—**

N. Greening & Sons, Ltd., 16, Finsbury St., London, E.C.2. "Setscrew, Finsquare, London." London Wall 1082.  
Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

**Wires and Cables (Aeroplanes)—**

Bruntons, Musselburgh, Scotland. "Wiremill, Musselburgh." Musselburgh 28.  
Craddock, Geo., & Co., Ltd., Wakefield, England. "Craddock, Wakefield." Wakefield 466 (3 lines).

**Wirework—**

Terry Herbert & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

**Wood Refuse Suction Gas Producers—**

Ruston Proctor & Co., Ltd., Lincoln, England. "Ruston, Lincoln." Lincoln 580.

**Woodworking Machinery—**

Robinson, Thomas, & Son, Ltd., Railway Works, Rochdale. "Robinson, Rochdale." Rochdale 407.  
Sagar, J., & Co., Ltd., Halifax. "Sawtooth, Halifax." Halifax 136.  
Wadkin & Co., Leicester. "Woodworker, Leicester." Leicester 3614.

**BLACK  
ENAMEL.**

**AEROPLANE  
GREY PAINT (flat).  
Oil and Petrol  
Resisting.**

**TRANSPARENT  
WOOD FILLER.**

**Subject to  
A.I.D.  
Inspection.**

# HARLAND'S

## VARNISHES, ENAMELS AND FINE COLOURS.

By Appointment to



His Majesty the King.

**MERTON, LONDON S.W.19.**

ESTABLISHED 1791.

**GOPAL  
VARNISHES  
for  
AIRSCREWS  
and  
EXPOSED  
WOOD PARTS  
&C.**

**WHITE DOPE  
RESISTING PAINT.**

**Subject to  
A.I.D.  
Inspection.**

**The Hollow Structure and Aircraft Co., Ltd., Patent.**

## WOOD PROBLEM SOLVED.

# HOLLOW SPARS

And Struts for all types of machines.

**Any length, shape or section without joints.**

FULL PARTICULARS FROM THE SOLE LICENSEES,

**ROBERT YOUNG'S CONSTRUCTION CO., LTD.,**

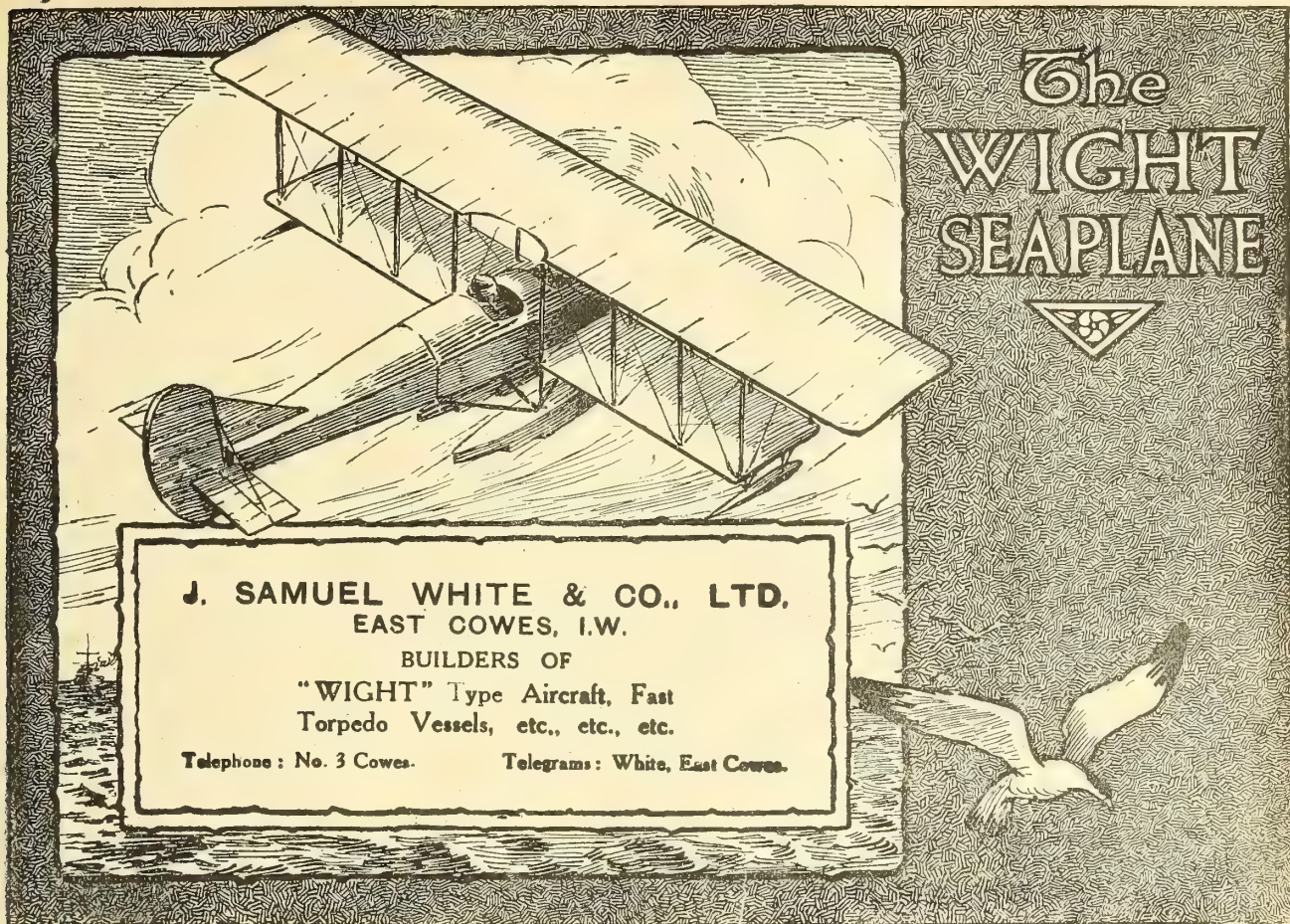
AIRCRAFT CONTRACTORS,

**CANONBURY WORKS, ESSEX ROAD, LONDON, N.**

TELEPHONE—  
DALSTON 2985.

TELEGRAMS—  
BYLDINCONT NORDO LONDON."



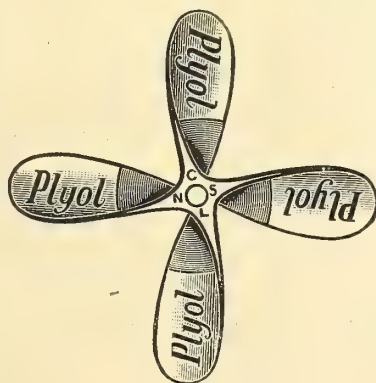


**The  
WIGHT  
SEAPLANE**

**J. SAMUEL WHITE & CO., LTD.**  
EAST COWES, I.W.  
BUILDERS OF  
"WIGHT" Type Aircraft, Fast  
Torpedo Vessels, etc., etc., etc.  
Telephone: No. 3 Cowes.      Telegrams: White, East Cowes.

**"PLYOL"**

THE  
BEST CEMENT  
FOR  
THREE-PLY,  
Veneering, etc.



Registered Trade Mark.

**ALDGATE CASEIN WORKS.****NIEUWHOF, SURIE & Co., Ltd.**

HEAD OFFICE

**5, Lloyds Avenue, London, E.C. 3.**

Works:

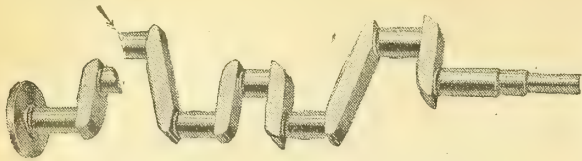
**ALDGATE AVENUE, ALDGATE, E.C.**

Also Caseln especially adapted for  
Waterproof Paints, Varnish, etc.

Telephones  
AVENUE 34, 35.

Telegrams:  
'SURICOLON, FEN LONDON.'





A heavy four-throw crankshaft broken across a 2 1/2 in. journal. Repairs like this one are done in the Barimar Factory every day.

## BARIMAR Welds Crankshafts

UNDER

### "MONEY-BACK" GUARANTEE

**T**HERE is no replacement more difficult to get to-day than a crankshaft. Our customers tell us that spare crankshafts are as rare as golden sovereigns.

Barimar welds crankshafts by an Exclusive Welding Process—the only process that can make strong joints in heavy sections of carbon steel.

Thousands of crankshafts have been welded by Barimar, and no case of breakage under normal service conditions has been reported. Many Barimar-Welded crankshafts have been in use for years.

Barimar's Testing and Inspection Department has devised standard tests for crankshaft repairs, and the Safety Factor receives careful consideration.

Send your broken steel crankshafts, driving gear, machine tools, &c., to Barimar, and get the job done right and delivered quickly.

Our new Manual "B C" "The Welding Test" is now ready. The published price is 6d., but to those who have fractured metal parts to repair we shall be pleased to send copies post free. Please quote "B C" and mention "The Aeroplane."

### GET THAT REPAIR TO .. BARIMAR TO-DAY ..

Strip all fittings, attach label with your name and address, and, if weight permits, rush the repair to nearest passenger station. Please pay carriage if sent by goods rail. Advise by post, giving instructions and route.

Address all repairs to Dept. "B C."

# BARIMAR

LIMITED,

10, Poland Street, London, W.1.

Telegrams:

Bariguamar, Reg., London.

Telephone:

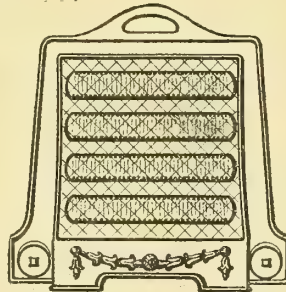
Gerrard 8173



Crankshaft after welding and machining. This crankshaft has been in constant use for three years. In this case a Barimar Weld saved about £35.

## BELLING ELECTRICAL ACCESSORIES

### AIRCRAFT Manufacturing Purposes.



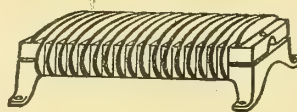
#### ELECTRIC FIRE.

OFFICE PATTERN. List No. 617.

An ideal fire for small offices, waiting-rooms, passages, etc. We have also supplied a large number to Aerodromes for general heating. Numerous other designs are available.

PRICE 35/-

Dimensions—Height 17 3/4 in., Width 17 1/2 in., Depth 5 1/2 in.



#### ELECTRIC

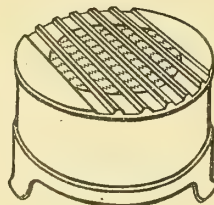
#### AIR WARMER.

List No. 960.

A reliable low temperature heating appliance, suitable for work rooms, etc. Can be used in any position without risk of fire.

PRICE 25/-

Dimensions—Length 15 1/2 in., Width 6 1/2 in., height 4 1/2 in.



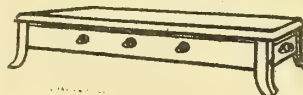
#### ELECTRIC

#### BOILING RING. List No. 7.

This will do all the same operations as an ordinary gas ring. Used for heating glue pots, and when loaded at 250 watts can be attached to any electric lampholder.

PRICE 15/-

Diameter 7 in.



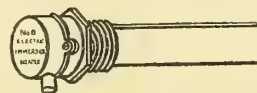
#### ELECTRIC

#### HOT PLATE. List No. 18

Useful for keeping food warm, and also for drying purposes of all kinds.

PRICE 100/-

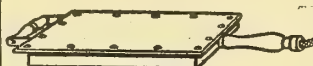
Size 36 in. by 18 in.



#### ELECTRIC

#### IMMERSION HEATER.

A reliable appliance for heating water, oil and other liquids. Can be easily fitted to existing tanks, etc.



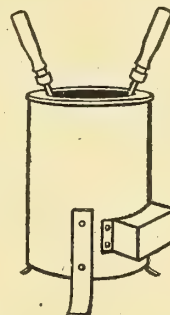
#### ELECTRIC

#### ENGINE WARMER.

For placing under engine in cold weather to prevent freezing. They are quite gas and fireproof.

PRICE 40/-

Size 12 in. by 7 in.



#### ELECTRIC

#### SOLDER POT.

Type A.

This is the latest system for heating ordinary soldering irons, and consists of a pot of molten solder into which the irons are placed for a short time till heated.

PRICE 65/-

Dimensions—Outside diam. 8 in., inner pan 5 1/2 in. diam. at top, Depth 7 in.

All the above prices are subject to an advance of 25 per cent.

Our Catalogue illustrates many other special appliances we make for Manufacturing Purposes, Munition and Factory Work, Hospitals, Mess Rooms, etc.

**BELLING & CO.,** MANUFACTURING  
ELEC. ENGRS.,

DERBY RD. WORKS, MONTAGUE RD., EDMONTON, LONDON, N.18.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# STEEL TUBING IN STOCK

TRADE MARK.



MEANS LONG LIFE

Get your Requirements at once.  
We have a very large quantity of  
 $\frac{3}{8}$  in. outside diameter by 10, 11,  
12, 13, 14 and 15 gauge, besides  
other small diameters.

This stock will not last long, and we  
advise buyers to send instructions  
immediately.

**The Steel Tube, Tubular Spanner & Presswork People**

Telegrams:

"Accles,  
Oldbury."A.B.C. Code,  
5th Edition.

OLDBURY,

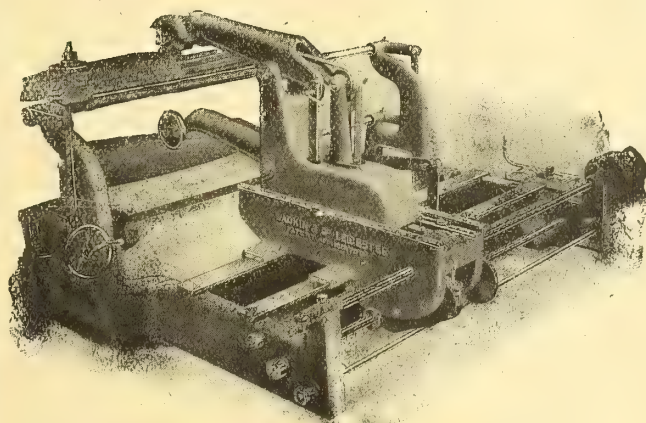
BIRMINGHAM.

Telephones:

Oldbury, 111.

(4 Lines.)

## INCREASE *YOUR* Propeller Output!



Automatic Propeller Shaper, K.E.

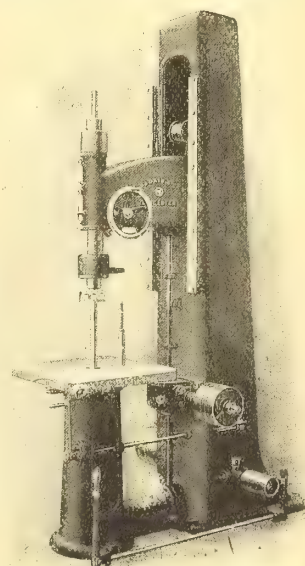
Some Advantages  
of our Shaper.

—  
Every blade identical.

—  
Less balancing  
required.

—  
No scraps through  
careless shaping.

—  
Work performed in a  
fraction of the time  
taken by hand.



Propeller Boring &amp; Recessing Machine, K. A.

WRITE FOR LIST OF USERS.

Sole Makers and Patentees:



# WADKIN & CO. LEICESTER

Telegrams: "WOODWORKER," Leicester.

Telephones: 3614 and 3615.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



The **LARGEST** and most  
Up-to-date

**CIVILIAN  
SCHOOL**  
in  
ENGLAND.

**LEARN TO FLY AT  
BOURNEMOUTH**  
IMMEDIATE VACANCIES

12  
Solo and Dual  
Aeroplanes in USE.  
Over 20 othe Aero  
planes and Engines in stock.

**SPECIAL TERMS for ONE  
MONTH for FULL COURSE**

School Approved by R. Ae. Club.

Pupils Coached for the Air Services.

PARTICULARS FROM  
**BOURNEMOUTH SCHOOL OF FLYING, BOURNEMOUTH.**

**CONTRACTORS TO THE ADMIRALTY.**

Telegrams: "SUPERMARINE,"

'Phone: WOOLSTON 37.

ESTABLISHED 1912.

# The Supermarine

## Aviation Works Ltd

Designers and constructors of Aircraft.

FLYING WATER & SLIPWAYS:

**WOOLSTON**

H SCOTT-PAINE, GENERAL MANAGER



OFFICES & WORKS:

**SOUTHAMPTON**

ENGLAND.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# ALUMINIUM CASTINGS

OF EVERY DESCRIPTION.

We make a  
Speciality  
of  
Aeronautical  
and  
Automobile  
Work.

We are making many thousands of **Aluminium Die Castings** weekly under the celebrated **Cothias** process—in many cases **entirely eliminating** machining operations, and we hold the sole manufacturing rights in the British Empire for this process.

Chemical and Physical tests are made on our own premises, and our **Castings**, both **Sand** and **Die**, are produced under the most up-to-date and scientific methods.

Sole makers of the **Birmal Aluminium Pistons**, thousands of which are running to-day in a highly satisfactory manner under the most severe conditions.

Highest  
Class  
Castings to  
Government  
Specifications.  
Prompt  
Delivery.

**BIRMINGHAM ALUMINIUM CASTING (1903) CO., LD.**  
**Cambridge Street Works, BIRMINGHAM.**

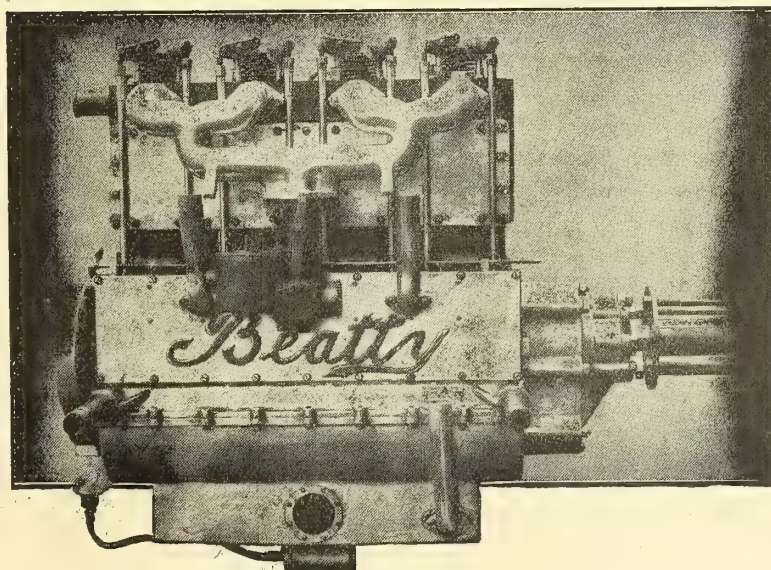
## The Beatty Monobloc Aero Engine

H.P. = 60.

R.P.M. = 1800  
Engine Shaft.

Prop. speed =  
1200 R.P.M.

Weight = 225 lbs



Petrol  
Consumption  
4.28 galls. per  
hour.

Oil  
Consumption  
.18 galls. per  
hour.

*Specially Designed and Developed for School Work.*

FULL PARTICULARS **The Beatty School of Flying Ltd.** LONDON AERODROME  
Telephone . . . Kingsbury 138.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





**CELLON**

**NON-POISONOUS**

**DOPE**

**CELLON, LTD.,**  
Broad Street House, E.C. 2.

Telephones: London Wall 5359, 8622.  
Telegrams: "AJAWB London."

**SBOAC**

GEOFFREY WATSON 1917

CELLON WORKS



## PATENTS INDEX.

The subjoined list of recent inventions has been specially compiled by THE AEROPLANE from the current Official Patents Records.

## PATENT APPLICATIONS.

- Anderson, T. Device for indicating departure from level of aeroplanes, etc. No. 2636. Feb. 14th.  
 Aner, M. A. Anti-aircraft devices for cities, etc. No. 2634. Feb. 14th.  
 Barker, W. H. Clinometers for aircraft. No. 2766. Feb. 16th.  
 Bignold, S. B. Aircraft and motor vehicles. No. 2647. Feb. 14th.  
 Bowman, G. Motor vehicles on which anti-aircraft guns are mounted. No. 2709. Feb. 12th.  
 Caproni, F. Aeroplanes. No. 2798. Feb. 16th.  
 Cather, J. S. Method of supplying aviators with oxygen\* when at high altitude. No. 2529. Feb. 12th.  
 Cortes, S. V. Methods of propulsion of ships, boats and flying-machines. No. 2426. Feb. 11th.  
 Coxen, W. T. Method of reinforcing spars, struts, etc., of aeroplanes. No. 2804. Feb. 16th.  
 Crossley, J. Aviation. No. 2807. Feb. 16th.  
 Donovan, F. D. Magnetic compasses for aircraft, ships, etc. No. 2693. Feb. 15th.  
 Ellis, G. Fishplates or tie-pieces for roof trusses, girders, hangars, etc. No. 2589. Feb. 13th.  
 Gray, F. J. Detector of submarines, mines, etc., at sea, of aircraft ashore or at sea, and means of scouting on land or at sea. No. 2699. Feb. 15th.  
 Hall, F. H. Aeroplane wings. No. 2690. Feb. 15th.  
 Harrison, A. Aeroplanes. No. 2708. Feb. 15th.  
 Johnson, J. J. J. Aerial bombs. No. 2441. Feb. 11th.  
 Jones, W. H. Rotary internal-combustion engines and propellers for aircraft, etc. No. 2803. Feb. 16th.  
 Letord, E. Strengthening and squaring plates for frameworks of aerial machines. No. 2535. Feb. 12th.  
 McCreith, J. J. Level for aircraft. No. 2792. Feb. 16th.  
 Mercer, W. A. Constructing hollow spars, struts, masts, air propellers, stretcher bars, etc. No. 2572. Feb. 15th.  
 O'Brien, T. B. Means for starting aircraft. No. 2723. Feb. 15th.  
 Oldman, J. A. Level for aeroplanes, etc. No. 2638. Feb. 14th.  
 Webster, A. Bullock. Lever indicator for aircraft, etc. No. 2547. Feb. 12th.

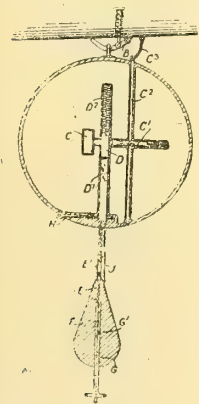
## COMPLETE SPECIFICATIONS ACCEPTED PRINTS OF WHICH CAN BE OBTAINED ON AND AFTER MARCH 7TH, 1918.

- 113,100. May 18th, 1916. Antoine, T. Flying-machines.  
 113,134. Feb. 7th, 1917. Saloun, M. Anti-aircraft projectiles.  
 113,153. Feb. 16th, 1917. Wilson, J. W. Hinging of ailerons and balancing or auxiliary planes on aeroplanes.

## ABRIDGMENTS OF RECENTLY PUBLISHED SPECIFICATIONS.

- 11,954. Bombs and the like. BRADLEY, C. W., 19, Shaa Road, East Acton, London. March 14th, 1916.

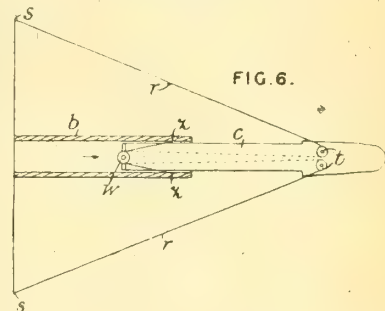
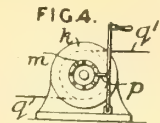
Relates to bombs and the like of the kind having a forwardly projecting striker adapted to effect explosion at a distance from the ground or target equal to the length of the striker, and consists in an arrangement wherein the striker, comprising a weight in which is a slidable impact-pin, is operatively connected to the firing-mechanism by a Bowden wire. In the construction represented in the drawing, which shows diagrammatically a bomb suspended from a discharging-device B on an aircraft, a weight F is connected to the casing of the bomb by the outer sheath E<sup>1</sup> of a Bowden wire, the wire E itself connecting a pin G to a block D. The pin G is retained by a copper or other plate G<sup>1</sup> within the weight in a position in which it holds the member D against the action of a spring D<sup>2</sup> so that it blocks the path of a firing pin C<sup>1</sup>. When, after the removal of the safety-pin H, the bomb is dropped from the device B, it slides off a bolt C<sup>2</sup>, which normally locks the firing-pin C<sup>1</sup>, and is connected by a chain C<sup>3</sup> to the aircraft. On impact of the striker upon the ground or target, the pin G is driven through the plate G<sup>1</sup>, and the block D is thereupon pulled up by the spring D<sup>2</sup> so that the firing-pin C<sup>1</sup> can pass through a notch D<sup>1</sup> in the block and fire the detonator C. An additional wire J may, as shown, connect the weight F to the block D. The invention is applicable to bombs in general, including gas-bombs.



16788. Aeronautics. LA ROCHE, F., Grafton House, Golden Square, London. June 29th, 1916.

PLANES, CONSTRUCTION OF.—Sliding extension-planes are

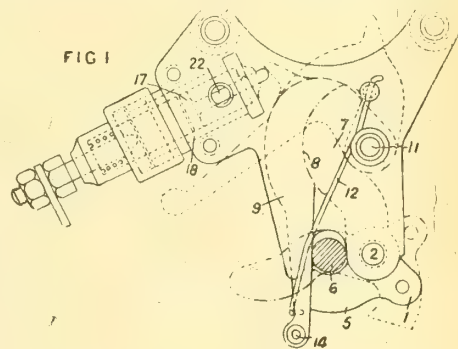
stayed by wires which pass over guides on the extension-planes and are secured at each end to the main planes or the fuselage, the arrangement being such that the stay-wires are maintained taut in all positions of the extension planes. As shown in Fig. 6, the stay-wires *r* pass round pulleys *l*, *w*, on the extension plane *c* and the ends *s*, *z* are secured to the fuselage and the main-plane *b*. The extension-planes are connected by cables *q*, *q*<sup>1</sup>, Fig. 4, to a winch *h* provided with a detent *p* engaging a ratchet-wheel *m*. On releasing the detent, the extension planes are forced outwards by the usual spring. The extension planes are returned by turning the winch handle. The extension planes are provided with rollers engaging guide-rails in the main planes.



## 17,346. Aeronautics; vehicle couplings; pile-drivers, etc.

PAGE, F. H., 110, Cricklewood Lane, London. Dec. 10th. [Cognate Application, 5271/16.]

In a catch or fastening, particularly for releasing bombs or like loads from aircraft, but also applicable generally and to releasing-apparatus for starting aeroplanes from ships, etc., to automatic couplings for railway vehicles, to gravity hammers or weights in pile-driving machines of the kind comprising a pair of levers one of which carries the load and is locked by engagement with a surface formed on, and concentric with the pivot of, the other lever, the concentric surface constitutes part of a recess formed in the latter lever and adapted to enclose an arm of the load-carrying lever in the locked position, thus preventing accidental disengagement of the levers. In the form shown, a bell-crank lever 1 pivoted at 2 has one arm 5 adapted to carry the load 6, and the other arm 7 arranged to bear against a concentric surface 8 forming part of a recess in the other lever 9 pivoted at 11, the arm 7 fitting in the recess as shown in the locked position. The catch is released by moving the lever 9 to the position shown in dotted lines. A spring 12 is preferably provided to press the lever 9 into the locking position. The releasing movement of the lever 9 may be effected by a pull on an ear 14, or by a piston 17 which operates in a cylinder 18 and may be actuated by a solenoid or by an explosive cartridge fitted in the cylinder and fired electrically; exhaust ports 22 for the products of explosion may be shrouded by gauze cylinders. In a modification, the arm 7 of the lever 1 is in line with the arm 5. Further, the pivot 11 may be at the opposite side of the load 6, in which case the locking-surface is convex.



17,511. Tanks. THOMPSON, A. D., Hill Crest, Merry Hill, Bushey, Hertfordshire. Dec. 14th. [Cognate Application, 9883/16.]

Relates to liquid-fuel tanks, more particularly for aircraft or motor-vehicles, and consists in the provision of means whereby loss of liquid may be avoided in the event of damage to the tank. The tank A is of cylindrical form with concentric casing B made in two parts connected by bolts B<sup>1</sup>. A packing-material C is provided between the tank and casing, and the structure is mounted on a fixed hollow shaft D. A gear-wheel E is mounted at each end of the casing B and is attached to it by means of a flange E<sup>1</sup>, and bolts E<sup>2</sup>, packing material C\* being interposed between the gear-wheels and the tank ends. In the event of the tank being perforated by a bullet, the outer casing may be partly rotated by means of gear-wheels mounted on a shaft and engaging with the gear-wheels E, so that the holes do not register. In order to reduce the friction between the packing and the







# Firth's Aircraft Steels.

|| Mark "A" Non-Magnetic  
Bullet-proof Plates  
|| For Armouring Aircraft.

Thos. Firth & Sons Ltd.,  
Sheffield.

# VICKERS LIMITED.

Contractors to the  
WAR OFFICE AND ADMIRALTY.

Aviation Department, Imperial Court,  
Basil Street, Knightsbridge, S.W.3.

Telephone No.—  
KENSINGTON 6810 (2 lines).



Telegraphic Address—  
VICKERFYTA, KNIGHTS, LONDON.





# You will find it in "AIRCRAFT SUPPLIES."

OUR FORTNIGHTLY HOUSE JOURNAL.

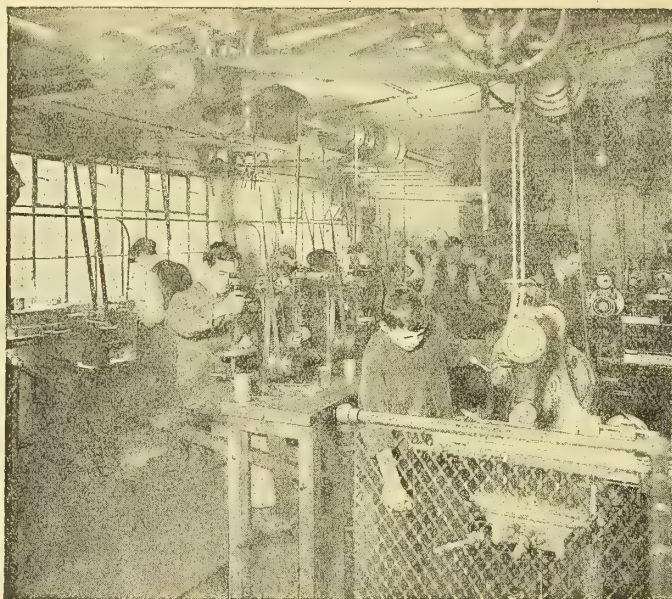
Look carefully through "Aircraft Supplies" and you will see that we can deliver from stock that part that is holding up your works. Our average weekly output is over 1,650,000 parts and we can supply your requirements from a tiny screw to a complete unit.

## Where Aircraft Parts are made

Here our men are busily engaged in turning out parts required for Aircraft construction.

## "ASCOL" LEAFLETS.

We have now ready Illustrated Descriptive Leaflets dealing with "Ascol" Specialities. These include Micrometers, Factory Stools, Dope Brushes, Dope Cans, File Cleaners, etc. These will be sent free, in a neat case, to the Aircraft Industry upon application.



THE

A portion of our upper machine shops engaged on the Manufacture of Aircraft Supplies

# AIRCRAFT SUPPLIES COMPANY LTD

CONTRACTORS TO THE AIR BOARD.

Head Offices, Showrooms, and Stores:

ASCOL HOUSE, 125 LONG ACRE, LONDON, W.C.2.

Representatives in Birmingham, Manchester, Leeds, Belfast, Northern Counties and Scotland, South Coast and the London District.

Managing Director:  
G. H. MANSFIELD.

Works:  
Little James St.  
London, W.C.1



Telephone:  
Gerrard 276  
(Private Branch Exchange.)

Telegrams:  
"Upcast, Rand,"  
London.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# THE AIRCRAFT TRADER

## MARKET TOPICS.

(Prices are for quantities on usual terms.)

Feb. 21st, 1918.

**COPPER.**—Copper supplies are very well maintained, notwithstanding the coal and transport difficulties which are being experienced in U.S.A. In fact, the authorities there are not sparing any effort to solve the problems referred to.

There does not appear to be any possibility of supplies being affected; production being well maintained. Prices, both here and in U.S.A., remain unaltered.

**TIN.**—The price of Tin still soars to unprecedented heights, owing to the uncertainty of future supplies. There is a very marked restlessness to be observed, and, to all appearances, prices will continue to fluctuate considerably. On Thursday last, there was a particularly sharp advance, sellers being very backward, and cash Tin brought £323.

Comparative prices.

To-day, 20th .....	£314 per ton.
February 14th .....	£323 ..
February 8th .....	£305 ..
Last Month .....	£298 ..
Highest Price, 1917 .....	£309 ..

**LEAD.**—Supplies are rather difficult to obtain, but cannot be considered very bad in view of the shipping troubles. Prices remain unaltered.

**STEEL.**—The mills are working at top pressure, and available supplies of Aircraft Steels are certainly increasing. Unlike several other materials required for Aircraft construction, the position now, compared with the situation six months ago, is very satisfactory, and shows a marked improvement. There is a rumour that the official prices are likely to be advanced in the near future to cover the continued advances in wages, fuel, etc., etc.

The Ministry of Munitions issued on Feb. 14th, through the Press Bureau, a circular giving particulars of the advances in the prices of High-Speed Steel which came into operation on Feb. 1st, and were given in THE AEROPLANE of Feb. 7th. The increased prices of Scrap High-Speed Steel were omitted from last week's list; they are as follows:—

Bar Ends, 6d. to 9d. per lb. net.

Millings and Turnings, 5d. to 8d. per lb. net.

Delivered at works, 4s. per cwt. to be allowed for packing.

Cast Steel prices still continue abnormally high.

**TIMBER.**—A little Silver Spruce has recently been received, but the quantities, although very acceptable, do not bring us any nearer the end a most critical shortage of this wood. Instructions are now being given that Silver Spruce must not be used for certain parts of Fighters, but why this was not done months ago is beyond comprehension.

Prior to these instructions being given, authority had certainly been issued for the use of substitutes on certain parts, but the use of Silver Spruce for these parts had not been forbidden. Very large shipments of Silver Spruce substitutes have recently arrived, and constructors are advised to apply to the Air Board for supplies to be allocated to them.

Mahogany supplies are very satisfactory, and prices are fairly reasonable.

The 3-ply position improves, but very, very slowly, and it is nearly as difficult to obtain supplies of 3-ply as it is to get Spruce.

Prices remain unchanged.

**FABRIC.**—Probably officialdom will move shortly and inform constructors if the prices for 1918 contracts will be higher than 1917, and if so, what the increases will be.

Supplies are fairly satisfactory, but the future requirements are causing anxiety, and there are rumours that the number of components on which cotton fabric can be used will be increased.

## THE HISTORY OF DOPE.

The following two letters on the History of Dope are of interest:—

Sir,—I have been interested to peruse the second series of "The British Aircraft Industry," included in your Aeronautical Engineering Supplement, and think that, perhaps, the following remarks may be of some use to the author of the article, and perhaps, your readers.

It is rather surprising that Mr. Hearne has been unable to determine as to who first applied cellulose solutions to aircraft.

While some doubt does in fact exist as to who was the inventor of these solutions for aircraft purposes, there are yet, however, good grounds for attributing their origin to Dr. G. Austerwiël (consulting engineer to the Astra Co.), who in 1909 extensively investigated the properties of cellulose, and its possible use for the proofing of fabric employed for airships and aeroplanes.

In 1910 Dr. Austerwiël, at the works of the Astra Co., determined that, by first covering the planes with loom state fabric and then treating with his cellulose solutions, the whole of the covering tightened on the frame-work, due to the contraction of the cellulose film, deposited by means of volatile solvents; the film firmly adhered to the fabric, and possessed those basic properties which now so largely contribute toward the efficiency of modern aircraft.

A study of the respective values of nitrocellulose and acetylcellulose led Dr. Austerwiël to a very natural selection of those of his solutions having the latter as a base.

It has, however, been stated that Muller in the same year first suggested cellulose acetate in the form of films for fixing to aeroplane canvas.

Some time later, the name of Eichengrün, of the German Bayer Co., was also associated with what are now known as Aeroplane Dopes, and he has, indeed, been credited with being the inventor.

One can at any rate definitely state that in France, Dr. Austerwiël was undoubtedly the originator, and in Germany, Eichengrün.

In 1910 Dr. Austerwiël founded the French Emaillite Co., and, shortly afterwards, his dopes were introduced into England.

The first aeroplanes were, of course, not doped with cellulose acetate compositions.

First of all rubbered canvas was used, then oiled canvas; next, canvas coated with collodion containing castor oil.

The French Pilot-Constructor Voisin, who had been an art student, used the same flour paste which he had formerly employed to tighten canvas on an easel, and the fabric so treated, when used in dry weather, did not "sag" as badly as those covered with rubber.

The natural development of this relative success led to the use of gelatine and similar substances, which, however, were more sensitive, as regards equilibrium, to the moisture of the air than cellulose acetate.

It will be remembered that the fatal accident to Delagrange was caused by his gelatined aeroplane being caught in a shower during flight.

A further development was effected by Henry Farman, who succeeded in partly protecting the gelatine with resin-sized paper.

Cellulose acetate dopes became to be generally used in 1910, and have since been the subject of considerable scientific investigation.

At the present time one is not permitted to discuss in any detail the technical advancement in dope solutions, but it is, of course, generally known that the results from the doping schemes of to-day afford considerable satisfaction to the technical authorities concerned, aircraft constructors, and, moreover, those who have so successfully studied the properties of various materials capable of use in aeroplane dope solutions, and having the necessary knowledge of the functions of each ingredient employed, have been responsible for the present high degree of efficiency in aircraft coverings.

It has been suggested in many quarters that the manufacture of aeroplane dope is a simple matter, but speaking with the authority of one who has spent many hours in the study of the subject in all its technical aspects, of the materials employed



and the fabrics upon which the dopes are used, I can only say that such a view is the opposite of fact.

This opinion will, I think, be fully supported by such recognised authorities as Dr. Ramsbottom, the N.P.L., and Dr. Goldsmith, etc.

The subject has, indeed, by no means been exhausted, and it is safe to assume that a good deal of progress will be made in the future.

I do not think that Mr. Barr can claim, nor does he in fact attribute to himself, the discovery in England of cellulose dopes for aircraft purposes, as their use both in France and Germany was well known in this country before such solutions were actually employed by any one of the constructors in the British Isles.

The supreme importance of the part played by cellulose in relation to aircraft is not, I think, too fully appreciated, and a great deal could be said on the subject.

Perhaps at some future date, when the Censor has ceased to function, it may be possible to deal more thoroughly with this very interesting question.

THE BRITISH EMAILITE CO., LTD.

(Signed) H. BAYLEY, Manager.

Sir,—I notice in your issue of Feb. 13th, under the heading of "The British Aircraft Industry," you give some particulars of Cellon, Ltd., and refer to a "claim of priority" regarding the use of Cellulose Acetate Dope for aeroplane wings in this country.

This claim cannot be substantiated, as it will be found on record at the Royal Aircraft Factory that a supply of Emailite Dope (which is also a cellulose acetate solution) was obtained from Messrs. Leduc Heintz and Cie., of Paris, and used on one of the early aeroplanes there before "Cellon" was thought of in England.

The adoption of Cellulose Acetate Dope at the R.A.F., was as a result of tests on samples obtained from the same source.

"Emailite" was advertised in the "Aérophile" early in 1911, if not before.

(Signed) "A. R."

### AEROPLANE FABRIC.

The following letter from the "Daily Mail" of Feb. 22nd is of interest:—

Sir,—With her acquisition of Courland the world's supply of flax passes into the hands of Germany. But still we see from the Board of Trade returns for last month that the export was still proceeding then:—

Linen piece goods ..... 7,476,400 yds.

Thread for sewing ..... 132,400 lbs.

The galling part of the whole business is that our Merchant Service conveyed the raw material from Russia to this country at the peril of their lives.

The shortage of flax will soon be felt in a very marked degree, but probably the Minister of Blockade will overcome the difficulty by sanctioning the issue of licences to trade with the enemy, as Mr. Runciman did when we found ourselves destitute of dyes in 1915.

ERNEST S. BROWN.

51, Milton Street, E.C.2.

### A NEW PATENTS AND DESIGNS BILL.

The following letter has been received:—

Sir,—A Bill, as above, has recently been introduced into the House of Commons. One of its chief objects is to improve that part of the present (1907) Patents and Designs Act which relates to the working in this country of patented inventions. It is, therefore, more particularly of interest to the manufacturing world.

Some of the principal features of the new Bill are very briefly referred to below.

At present any person may, at any time after four years from the date of a patent, apply for revocation of the same on the ground that the patented article or process is manufactured or carried on exclusively or mainly abroad. Unless the patentee proves that the invention is adequately worked here or gives satisfactory reasons why it is not, the patent may be revoked either forthwith or after a reasonable interval, unless in the meantime the invention is worked here to an adequate extent.

Under the new Bill any person interested may at any time present a petition alleging that the monopoly rights have been abused in any of the following circumstances:—

(a) After the four years the invention (being one capable of being worked in this country) is not being worked here on a commercial scale, and no satisfactory reason can be given for non-working; but if there has not been time to work the invention on a commercial scale the petition may be adjourned for a period sufficient to enable this to be done.

("Working on a commercial scale" means working by means of a definite and permanent organisation, and on a scale which is reasonable under all the circumstances.)

(b) If the commercial working of the invention here is being prevented or hindered by importation.

(c) If the demand for the patented article here is being met to an adequate extent and on reasonable terms.

(d) If, owing to the patentee's refusal to grant a licence upon reasonable terms, any existing industry here or the establishment of any new industry here is prejudiced, and it is in the public interest that a licence should be granted.

(e) If any industry is unfairly prejudiced by conditions attached by the patentee to the working of the invention.

On being satisfied that the allegations of the petition are proved, the Comptroller may exercise any of the following powers:—

(a) He may order the patent to be endorsed with the words "licences of right" (as to which see below). If this is done, every existing licensee shall be entitled to surrender his licence for one to be settled by the Comptroller in like manner as if the patent had been so endorsed at the patentee's request; such an order may be made notwithstanding that there may be an agreement subsisting which would have precluded such endorsement at the patentee's request.

(b) He may order the grant to the petitioner of a licence on certain terms. The patentee may be called upon to take steps to prevent infringement, and if he refuses or neglects to do so within a month, the licensee may institute the proceedings, making the patentee a defendant.

(c) If the Comptroller is satisfied that the invention is not being worked on a commercial scale here, and cannot be so worked without capital, for the raising of which it will be necessary to rely on the patent monopoly, he may, unless the patentee or those claiming under him will undertake to find such capital, order the grant to the petitioner or any other person able and willing to provide such capital of an exclusive licence, subject to certain provisions.

(d) He may revoke the patent either forthwith or after a reasonable interval, unless in the meantime such conditions as he may prescribe, with a view to preventing the abuse of monopoly rights, are fulfilled.

(e) He may decide to refuse the application.

The granting of an exclusive licence may be made conditional upon the licensee giving proper compensation for any money or labour expended by the patentee or any existing licensee in developing or exploiting the invention.

#### "LICENCES OF RIGHT."

The salient features of "licences of right" (which are new to patent legislation) are briefly as follows. If the patentee so requests, the Comptroller shall endorse the patent with the words "licences of right" if satisfied that the patentee is not precluded by contract from making the request, and, thereupon:—

(a) Any person shall at any time be entitled, as of right, to a licence upon such terms as, in default of agreement, the Comptroller may settle.

(b) In settling the terms the Comptroller shall be guided by the following considerations:—

(i) He shall, on the one hand, endeavour to secure to the patentee the maximum advantage consistent with the invention being worked by the licensee at a reasonable profit here.

(ii) He shall, on the other hand, endeavour to secure the widest possible user of the invention here consistent with the patentee deriving a reasonable advantage from his patent rights.

(iii) He shall also endeavour to secure equality of advantage among the several licensees, and for this purpose may, if he considers it advisable to do so, reduce the royalties or other payments accruing to the patentee under any licence previously granted.

In considering the question of equality of advantage, account is to be taken of any work done or outlay incurred by any previous licensee with a view to testing the commercial value of the invention, or to secure its working commercially here.

(c) The licensee may prohibit importation of the goods.

(d) Every licensee shall be entitled to call upon a patentee to take proceedings to prevent infringement, and if the patentee refuses or neglects to do so within a month, the licensee may institute such proceedings in his own name, making the patentee a defendant.

(e) If the infringing defendant is prepared to take a licence upon terms to be settled by the Comptroller, no injunction shall be awarded, and the amount of damages (if any) shall not exceed double the amount which would have been recoverable against him as licensee if the licence had been dated prior to the earliest infringement.

This paragraph shall not apply where the infringement consists of the importation of infringing goods.

(f) Renewal fees on a patent so endorsed shall be one moiety only of the fees otherwise payable.

All such endorsements are to be published for the purpose of bringing the invention to the notice of manufacturers.

If no licence exists the Comptroller may, on the application of the patentee, and of payment by him of the unpaid moiety of renewal fees which have become due since such endorsement, cancel the endorsement, whereupon the patentee's rights and liabilities shall be as before endorsement.

(Signed) H. T. P. GEE, Associate I.E.E., Patent Agent,  
70, George Street, Croydon.





# ARMSTRONG, WHITWORTH

## AIRCRAFT WORKS,

### NEWCASTLE ~ UPON ~ TYNE.



TELEPHONE :- 500 GOSFORTH.

TELEGRAMS :- ARMSTRONG AVIATION,  
NEWCASTLE ~ ON ~ TYNE.

# GWYNNE

## LIMITED

CONTRACTORS TO H.M. ADMIRALTY AND WAR OFFICE.

SOLE LICENSEES AND MANUFACTURERS IN THE BRITISH EMPIRE  
OF THE

## "CLERGET" PATENT AERO ENGINES.



WORKS & OFFICES: { CRISP ROAD, HAMMERSMITH, W.6. } LONDON.  
                                  { CHURCH WHARF, CHISWICK, W.4. }

TELEPHONES: 1910 HAMMERSMITH (3 lines).  
                  1780 CHISWICK (3 lines).

TELEGRAMS: "GWYNNE, LONDON."

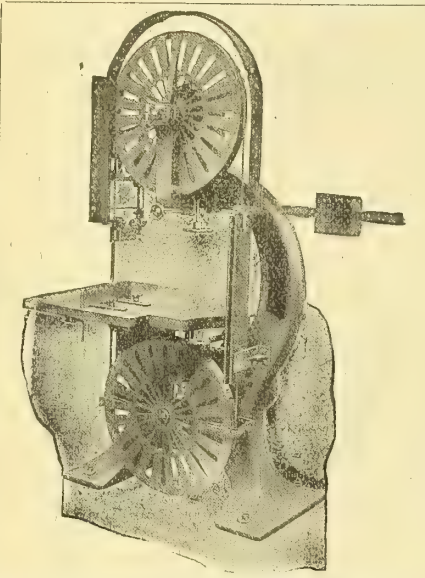
KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# HAIGHS

(OLDHAM) LIMITED

MANUFACTURERS OF ALL TYPES OF WOOD WORKING MACHINERY.



## C.K.S. Type High Speed Band Sawing Machine

Built in Three Sizes with Saw Pulleys.

26 inches, 30 inches, and 36 inches diameter.

**Globe Iron Works, Oldham.**

*Early delivery can be given.*

Telegrams: HAIGH, OLDHAM.  
Telephone: 1273 Oldham.



# H. & O., Ltd.

## Harris & Others, Limited,

**AIRCRAFT CONSTRUCTORS,**

*Old Town, Clapham, S.W.4.*

**WOODWORK, METALS, COVERING AND DOPING.**

Phone: Battersea { 1236  
1047

**Sub-Contractors to leading Aeroplane Builders.**

**On Admiralty and War Office Lists.**



(Continued from page 808.)

allow these young men to do the work, the Germans will think twice before they come to London. I have great hopes that, as we stopped the Germans coming to London in daylight, we shall now stop the Germans coming to London at night.

**Major D. Davies** followed in the same sense.

#### THE OFFICIAL REPLY.

**Major Baird** said: Let me take, first, points raised in the speech of my hon. friend (Mr. Joynson-Hicks), who has always shown such a great interest in air matters, and whose comments are always listened to with respect in the Service. He complained that the transition stage was rather prolonged. I can assure him that there has been no undue delay.

Let him realise that we have to deal with two Services, serving under two different discipline codes, with great traditions, different ranks, different rates of pay, and engaged in daily, hourly, nightly service against the enemy, and it is impossible to merge those two forces without an immense amount of the most careful work, so as to ensure that, whatever else may occur, when the fusion takes place, there shall be no confusion and no dislocation on the front.

Then, in making this fusion, we have, first, to settle all kinds of disciplinary and financial matters with the legal authorities and the Treasury.

We have then to lay down the new system, and in a perfectly clear, straightforward manner, to see to it that a pamphlet containing the regulations for working the new force will be in the hands of the officers concerned a reasonable time before the force comes into existence. We have now got a proof of the pamphlet, which will be distributed at a very early date throughout the whole world where officers and men of the Royal Flying Corps and the Royal Naval Air Service are now stationed, so that when the change takes place they will be aware of the position. [The arrival of that pamphlet is awaited with great interest.]

In supporting the arrangement which has been come to with regard to the Medical Service I am in the extraordinary good company of the hon. gentleman (Sir W. Cheyne). He presided over a most distinguished Committee which presented a Report to the Air Board. The Air Board accepted this Report, and it formed the policy of the Air Board with regard to the Medical Service under the new organisation.

The Air Board were only one of the three parties to the discussion, but the other parties to the discussion having possession, which is nine-tenths of the law, were in a considerably stronger position than we were, and it proved impossible to persuade the other parties to the discussion to accept the proposals of this Committee. But what have we succeeded in doing? We persuaded the Navy and the Army to agree to a system whereby they are made jointly responsible for the supply of men and for the success of a joint medical service, instead of their being, as they would have been otherwise, in determined hostility. [Then they ought to be ashamed of themselves.]

There is nothing that is more futile or more maddening, especially in time of war, when everybody ought to be fighting the enemy, than that anyone should devote even a single second to fighting his own countrymen. [Physician heal thyself!]

To insist on our starting a separate Medical Service now would only mean that there would be no Medical Service at all, while the fight is in progress, and thousands of lives might be lost which might have been saved by the adoption of a system which, at any rate, is a great improvement on anything which has been done before. [It would be perfectly simple, under the Air Force Act, for all medical officers serving with the R.N.A.S. and R.F.C. to resign their Navy and Army commissions and become Air Force M.Os. The Act provides for such action by officers and men of the Senior Services.]

It is not fair to say that the Medical Service of the Air Force has been placed under the Army or under the Navy. It is under the Air

Council, but we do secure the co-operation of the Naval Medical Service and of the Army Medical Service.

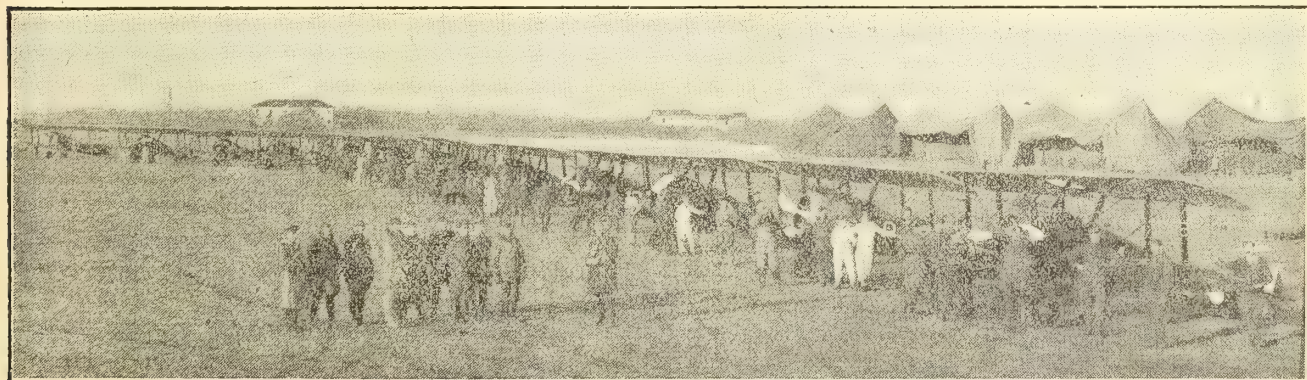
**Major Davies:** Is it proposed to put the Director-General of the Medical Service on the Air Council?

**Major Baird:** No, he will not be on the Air Council, but the administrator of the Air Service has direct access to the Secretary of State. In the meantime the Air Council have gone as far as they can to make arrangements for the medical side of their work. A small staff at the Air Ministry is to be continuously at work on various problems. At the request of the Director-General of Military Aeronautics, military medical authorities have been working on special lines in regard to the Royal Flying Corps. The officers are now examined by a special medical board before they are sent for training in France. Another staff is engaged in the medical examination of officers suffering from disabilities caused by flying. A special type of hospital has been set apart for the treatment of members of the Flying Force, both military and naval, and in addition a Royal Flying Corps hospital, which is maintained entirely by private subscription—[Started and still excellently run by Dr. Swan]—provides accommodation for seventy serious cases and more than a hundred convalescent cases.

Now I come to the question of Loch Doone. I suppose it is a breach of rule for me to mention the name of this place, but it is the place which has been referred to by hon. members who talked about the aerodrome in Ayrshire. I may explain what happened from the point of view of the old Air Board. In 1916 the French had a school of gunnery which enabled them to give a particular kind of instruction. That school was visited by representatives of the Royal Flying Corps, and in order to reproduce the same course of instruction as was given by the French it was thought desirable that we should obtain if possible a similar area of ground with a large expanse of water here. Many places were examined. Their advantages and disadvantages were balanced, and the conclusion was reached that Loch Doone offered the best prospect of success.

The technical experts of the War Office had doubts as to the feasibility of making the school, but the Flying Service held that Loch Doone was the best place, provided that the difficulties were not insuperable. Works were commenced, but they proved to be far more difficult and far more costly than was originally anticipated. When the Air Council took over the buildings and undertakings of the Royal Flying Corps and the Naval Air Service we wanted to know what it was we were taking over. We found that amongst other things Loch Doone was included, and an officer of the Air Council went down to look at it. On his report we came to the conclusion that, from the point of view of the works which had to be carried out, there was no hope of completing those works during a reasonable period of time. We realised that while there was an immense amount of work required to be done there was a limited number of people to do it, and it did not appear to us right or proper to use that limited labour, or the equally limited material, at a place at which there seemed to be no prospect of its being ready for use during the war, although eventually it might be made into an aerodrome. And we said: "We will apply to this public business the principles which we apply to our own private businesses, and we will cut the loss." [Which appears quite an intelligent proceeding.]

Hon. members have alluded to casualties, and they have attributed casualties to a variety of causes—machines, inadequate medical examination, aerodromes, and so forth. Will hon. members please believe that there is not any body of men on earth more anxious to reduce casualties to the lowest possible limit than those responsible for the Air Services? It is not easy to say to what casualties are really to be ascribed. A very large proportion of casualties, no doubt, are due to errors of judgment, but if in time of war you try to establish different categories of casualties, and to say that if there had been more



IN ITALY.—A Squadron of Sopwith "Camels" about to take an airing.



medical examinations, or that if there had been different machines there would have been fewer casualties, is, I think, not to do anything in which there is any advantage. [One does not hesitate to say that if drinking were absolutely prohibited in Air Force messes there would be, at any rate, fewer minor casualties and crashes.]

I think my hon. friend opposite (Mr. Joynson-Hicks) said something about the casualties at home being larger than the casualties at the front.

**Mr. Joynson-Hicks:** I did not, but somebody did. I purposely gave no figures. [It was, in fact, Sir Hamar Greenwood, as Major Baird would have known if he had been attending to his work.]

**Major Baird:** Somebody said that, but I have taken the trouble to ascertain, and I can say that is absolutely without foundation. There is nothing approaching that.

**Sir C. Seely:** Did the hon. and gallant gentleman answer the question I asked as to the powers, if any, that the Versailles Council have over the Air Council?

**Major Baird:** I am glad my hon. friend reminded me of that. Those powers are not defined yet. We have our representative at Versailles, but the exact power as between the two has not yet been defined. Undoubtedly, it will be in a short time.

**Mr. King** moved an amendment that "Air attacks against the enemy should be carried out with military objectives and in such a manner as to avoid, as far as possible, injury to non-combatants, women, and children." He said, among much which is not of interest:—

There appeared in one of Lord Northcliffe's papers, a short time ago, what purported to be a facsimile of a printed bill which we were given to understand was thrown from one of our aeroplanes as they flew over the enemy country. That bill stated, in German, that the raid was made as a reprisal for the sinking of the "Lusitania." I would point out that the German was very bad, and in about ten words three were wrong, and there were three mistakes in grammar. I took the trouble to send this to my hon. friend the Under-Secretary of State for War. He very courteously made full inquiries as to whether any such bill was ever used or disseminated by the aeroplanes of our forces, and he gave me to understand that the whole thing was a fraud, notwithstanding this facsimile which Lord Northcliffe's paper published, and we must speak very respectfully of him now, because he has been made a Director of Propaganda for the enemy. [An excellent specimen of our officials' ideas of propagandist work among our own population.]

**Mr. Pringle** seconded the Amendment.

**Major Baird:** So far as my knowledge before the war goes, the men, women, and children of Germany all lived in the same towns. If they continue to do so, it is physically impossible to drop bombs on German towns without running the risk of killing German women and children. I am sorry, and everybody who has anything to do with it is sorry for it. The whole of the towns in the Rhine Valley are towns where munitions are manufactured. It would be difficult to mention one where these are not manufactured. They are all objectives of military interest, and it is perfectly open to us to bomb those places, just as it is open to the Germans to bomb our places. I am sorry I cannot more clearly define the intention and policy of the Government than that, but I think it is sufficiently categorical. We have started bombing German towns. We mean to continue bombing German

towns, just as the Germans bomb our towns and will bomb our towns as long as they can. That is the policy of both countries. It is, unfortunately, one of the new phases of warfare invented by the Germans and carried out by them. I cannot say more than that. [One is under the impression that the first bombs dropped in the war were dropped on Cologne and Düsseldorf, so that it would seem that the R.N.A.S. can claim the honour of initiating the new form of perfectly legitimate war. One is glad to see the official intention laid down as stated above.]

**Mr. Morrell** supported the amendment, which was negatived. Motion made, and question proposed, "That a number of Air Forces, not exceeding 1,000, all ranks, be maintained for the Service of the United Kingdom of Great Britain and Ireland at home and abroad during the year ending on March 31st, 1919."

#### MONDAY'S DEBATE

The Debate was continued on Monday, Feb. 25th—on "Vote A," for Personnel and Pay:—

It appears that **Mr. Billing** dealt with the Acceptance Park Scandal. He also dealt with the number of different types of engines still existing—their existence necessitating the carrying of an enormous quantity of spare parts, which occupy space and waste the time of store-keepers, and those who have to handle matériel, and he advocated that most of them should be scrapped.

**Major Baird**, replying, said the hon. member's picture of this country turning out 61 types of standardised engine was fantastic. [One gathers that Mr. Billing said that 61 types exist, not that they are being manufactured.] The inference to be drawn from Mr. Billing's speech was that the German types were better than ours. If that was the case, it was curious that the Germans were now imitating types which we used to make and which we had now improved. The hon. member talked with very little knowledge on these subjects. [At any rate, Major Baird's replies indicate that his knowledge is no more extensive.] He had no intention of saying how many types we were making, but we are not making 61, nor spare parts for 61.

The hon. member had made extremely unfair and unfounded aspersions on General Conway Jenkins, who, as the hon. member had said, was an able business man. He was more, and was what the hon. member was not—an extremely capable and efficient flier, which was extremely necessary in the case of a man who had to accept machines in which our men had to fly. He defended the system under which the machines were accepted at the door of the factory. [They are not accepted at the door of the factory, that is precisely the trouble.] Up to that point the Ministry of Munitions was responsible, but afterwards they were subjected to the highest test by General Conway Jenkins, and there was no intention of altering the system.

Referring to a recent air raid, he said that the hon. member might, as he had said, have heard a British aeroplane over his house 25 miles from London the other night, and then have heard the guns. But it was ridiculous to suggest that the guns were firing at that machine.

The pamphlet showing in detail the exact conditions under which officers and men will be transferred to the Air Force was ready, and would be scattered broadcast over the world in a very few days, and would be in the hands of all the men who would constitute the new force.

#### THE D.G.M.A.

Brigadier-General Ellington, whose appointment as Director-General of Military Aeronautics was announced in the "London Gazette" of Feb. 20th, was born in 1877, entered the Royal Artillery in 1897, and has seen active service during the present war, being twice mentioned in dispatches and awarded the C.M.G. He was appointed Deputy Director of Military Aeronautics last November.

#### THE 1918 OFFENSIVE.

**Mr. Philip Gibbs**, writing in the "Daily Telegraph" on Feb. 25th from the British Front, says, concerning the German preparations for the offensive:—

Meanwhile it is certain that the enemy is preparing to bring tanks into action. We knew some time ago that he was training some of his troops to attack behind them, and some of our observers have seen a tank behind the enemy's lines. It was lumbering around with a body of German infantry on each side of it. This year may see tanks against tanks, and many curious alterations in tactics resulting from this moving machine-gun emplacement, but we have a long start in experience and technique, and the advantage should be immensely on our side.

Readers of THE AEROPLANE will remember that early in 1915 references appeared in this paper to the appearance of a new weapon which would sooner or later produce open warfare again, and that in 1916 it was distinctly stated that fleet-actions between tanks would ultimately take place.

#### ANOTHER AIR APPOINTMENT.

The Secretary of State for Air has appointed **Mr. W. A. Robinson, C.B., C.B.E.**, Assistant Secretary, His Majesty's Office of Works, to be Permanent Secretary to the Air Council in the Air Ministry.

**Mr. William Arthur Robinson**, who was born in 1874, was educated at Appleby School and Queen's College, Oxford. He entered the Colonial Office in 1897, taking first place in the Civil Service examination, and became a first class clerk in 1905. He was Assistant Secretary to the Imperial Conferences of 1907 and 1911, and Secretary to the Dominions Royal Commission, 1911-12. In the latter year he was appointed Assistant Secretary to the Office of Works.

#### A DANGEROUS RUMOUR.

A report from Berlin via Rome on Feb. 7th, reproduced in many daily papers, says that the German aeroplane factories are unable to supply machines on order for the Government in the quantities stipulated for, only half this number being turned out. The output for the last two months only shows an increase of 25 percent.

A wise Censorship would have forbidden the publication of this rumour, as it is distinctly calculated to cause slacking in British factories.

#### PRESENTATION AEROPLANES.

The Mayor of Southend (Alderman Joseph Francis) presided at a well-attended meeting there on Feb. 21st, when arrangements were made for the "Business Men's Week," to be held in March, to raise £150,000 for the purchase of 150 aeroplanes. The Mayor promised £10,000.



# THE AIR COUNCIL AND ITS FUNCTIONS.

BY HENRY FORESTER.

Throughout the history of England there has been constant change and indecision in the government of the Military Forces of the Crown. The earliest armies were raised only as occasion demanded, and were commanded and administered by the Monarch or by the baronage putting the Army into commission.

When after the Restoration a Standing Army first came into being, the fears of Parliament, still unforgetful of the harsh days of Cromwellian domination, prevented any very decisive system of military control being instituted. The soldier is never too tolerant of democratic rule, and he is ever ready to support the monarchy under all conditions. Hence safeguard after safeguard has been devised to prevent the Army, or the Navy for that matter, becoming too powerful in the nation's affairs. The very existence of the Army has to be sanctioned annually by the Legislature.

## PARLIAMENTARY INDIFFERENCE.

The Services only become important in the days of war. In peace the soldier is an encumbrance on the land, ornamental perhaps, but too expensive to be a popular joy. Of so little importance was the Army considered when the drums of war were silent that it was not until June, 1854, that the Secretary of State for War ceased to look after the Colonies in addition to his other work. Year by year Parliament exercised its desire to economise on the military establishments, and even until the opening of the present war the Headquarters Staff were continually at loggerheads with the politicians over the necessities of national defence.

## PREVIOUS ADMINISTRATION.

It is only of recent years that all the different branches of the Service have been brought under one military head. Until 1855 the Master-General of the Ordnance and his Board commanded and administered the Royal Artillery and the Royal Engineers, without reference either to the Secretary of State or to the Commander-in-Chief. He was also responsible for the clothing of the remainder of the Army, a duty which he carried out under his own conditions, untrammelled by the desires of the general officer responsible for the efficiency of the Army in war.

Another official, the Secretary at War, a Minister of the Crown with a seat in Parliament, was responsible for the financing of the Army. His authority was necessary before a man or a horse could be moved. Without him, the soldier was unpaid and his dependents starved. Military schools, military prisons, and military chaplains were all under him for direction.

A third authority, His Majesty's Treasury, was responsible for the Commissariat Department, the worst the world has ever known. It was this department, and not the much-maligned soldier, which sent boots for the right feet in one vessel and boots for the left feet in another vessel to the troops in the Crimea! The Treasury also exercised a general control over the expenditure of the Army.

## AN IMPOSSIBLE ARRANGEMENT.

Unless these three departments lived in perfect felicity with the Commander-in-Chief there was little possibility of the successful prosecution of war. It need scarcely be said that perfect agreement was almost entirely unknown. Minutes of colossal length and couched in terms of almost repulsive politeness passed between these officers on points of majestic unimportance. Months were wasted in argument over a passage to Ireland and years in a discussion on the width of the gold lace adorning the seams of an officer's mess jacket.

## CO-ORDINATION.

Some degree of co-ordination was attained in 1855, when the Secretary of State for War became responsible at last for the efficiency of his own department, and the Commander-in-Chief for that of the Army in general. But the period of reform had only then begun.

Change after change was made between that date and 1904, when the Army Council, the present system of military government, came into being. In the intervening period of time the office of Commander-in-Chief, held for thirty-nine years by a Prince of the Blood, rose from insignificance to great power, and then swiftly sank again in 1895 to a position barely greater than that of a head of department.

## THE FORMATION OF THE AIR COUNCIL.

It is the present system of Army control—which closely resembles that of the more efficient Continental armies—that has been copied closely in the constitution of the first Air Council in the history of England. The Air Force is fortunate in many things, not the least being the opportunity of beginning with an organisation which has stood the test of the greatest war in which the English soldier has been privileged to take a seemly part.

Major Baird in his statement in the House of Commons on Feb. 21st, 1918, said that though the Air Council was founded on the Army Council, "It does not follow that will prove in the long run to be the wisest model." Nothing is certain in this life, but one cannot see that the Under Secretary has any grounds for his vague doubt. The Air Force has at least been saved centuries of evolution.

The members of the Air Council are as follows:—

The President of the Air Council (a Principal Secretary of State).

The Chief of the Air Staff.

The Master General of Personnel.

The Controller General of Equipment.

The Director General of Aircraft Production.

The Director of Lands.

The Parliamentary Under Secretary of State.

Two additional Members, one of whom is the Vice President of the Council.

## THE DUTIES OF THE PRESIDENT.

The President of the Air Council, like his prototype, the Secretary of State for War, is responsible to the Crown and to Parliament for all that concerns the Air Force. He is the mouthpiece of his Council, and is the only means of communication between the Air Force and the Legislature. Recommendations for Honours and Rewards pass through his hands and he is theoretically responsible for all promotions and for the removal of all officers unfit, owing to defective morals, for further service under the King.

Should any modification in the institution of the Air Force be necessary, the Secretary of State, or his Under Secretary, must bring the suggested scheme before Parliament in order that the elect of the people may mould it in such manner as their minds direct. He must defend his officers, both Civil and Military, from all external attack. Neither member of Parliament nor the Press should be permitted by him to revile or depreciate any of those in the Air Force who, like him, are serving their King. This is an idealisation of the actual behaviour of Secretaries of State who have been properly educated in their early youth.

## THE WORK OF THE PRESIDENT.

Apart from all this, his real vocation in life is to co-ordinate the work of his Council. He alone is to



position of pre-eminence and can insist on following some definite programme. A meeting of his Council may be discordant. The Chief of the Air Staff may require an allocation of personnel in order to carry out certain operations, and may meet with great opposition from the Master General of Personnel, while the Controller General of Equipment may be unwilling to carry out his share of the work. It then falls to the unhappy lot of the Secretary of State to decide what line of action shall be adopted.

He must exercise his discretion and be guided by the advice of his subordinates, but he must not dictate. He must not, like Mr. Foster in recent years, and Mr. Cardwell in the past, imagine himself to be possessed of a degree of wisdom transcending that of all soldiers, and insist consequently on a line of action which, though it may advertise him in the House of Commons, and possibly in the country, does not meet with the approval of his responsible advisers. Above all he must not pin his faith to a belief in the divine right of majorities. It is in his selection of subordinates and his judgment in the adoption of plans put forward by them that his claim to genius will rest.

The President of the Air Council, if he is wise, will devise no plan of his own, nor attempt any interference with the military conduct of his office, but he will, if he hopes to make that mark on history which has so great an appeal to those who regard themselves pleasantly as potential ancestors, insist on a unity of purpose in his Ministry and on a conservatism which will adopt changes with a careful attention to the teachings of experience.

#### THE CHIEF OF THE STAFF.

The most prominent appointment on the Air Council is that of Chief of the Air Staff. He is in a sense the Commander-in-Chief of the Air Force and he has great powers for good or ill. All that concerns operations in peace or in war lies in his field of action. At all times he is responsible for the training of the Air Force. Air intelligence is under his charge.

#### THE G.O.C. R.F.C. IN THE FIELD.

It is now made known in the "Gazette" that Major-General J. M. Salmond has succeeded Major-General Sir Hugh Trenchard as G.O.C. R.F.C. in the Field. No better appointment could have been made. General Salmond has the complete confidence and trust of the personnel of the R.F.C. As a commanding officer, whether of a squadron, a wing, or a brigade, he has been consistently successful. His efficiency and judgement are universally recognised.

Those who feared that when he vacated the office of Director-General of Military Aeronautics it meant that he was taking a backward step will never realise that he was taking another step forward in his brilliant career. Only an officer of exceptional ability could possibly have been appointed to succeed General Trenchard, and the wonderful work which the R.F.C. has been doing in France since the beginning of this year shows that the high moral of the Corps is being fully maintained.

#### A BEGINNING.

The Air Ministry have issued for publication the following table of British air raids into Germany from Dec. 1st, 1917, to Feb. 19th, a period of just over 11 weeks. The figures within parentheses denote the population of the localities in question:—

Dec., 1917.		Bombs dropped.	lb.
5.—Railway Sidings, Zweibrücken (14,700)...	1,344		
5.—Works, Burbach (—) .....	1,096		
6.—Works, Burbach (—) .....	2,216		
11.—Boot Factory, Pirmasens (34,000).....	1,594		
24.—Factories, Mannheim (290,000) .....	2,252		

His department is concerned with the organisation of the Air Force. All new establishments are passed by his officers and under his direction. All official books on the art of aerial warfare, and on Military History as it effects that side of war, are issued under his authority and written by officers selected by him.

#### THE BRAIN OF THE FORCE.

The Chief of the Air Staff is the principal military adviser of the Secretary of State. In times of peace schemes are prepared under his direction for the employment of aircraft in war under any conditions which appear to be possible.

There should be in his department detailed plans of the action to be taken by the Air Force against any of the nations with which it is possible that Great Britain may fight at any time. These plans are constantly altering as conditions change and as the information given by the Air Attachés at our Embassies abroad varies.

In war he is still responsible for the drafting of plans, but this time under conditions that are concrete. He advises the Secretary of State as to the correct manner in which to achieve a given object.

For instance, if it is desired to attack German towns from above, the Chief of the Air Staff, after consulting with the War Office and the Admiralty, and arriving at a position of agreement in so far as general strategy is concerned, prepares his suggestions and lays them before the Secretary of State for submission to the War Cabinet.

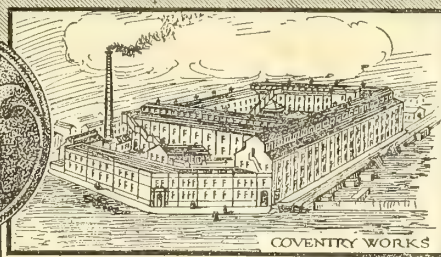
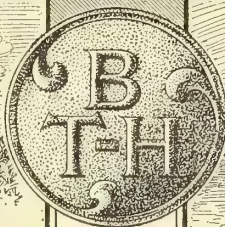
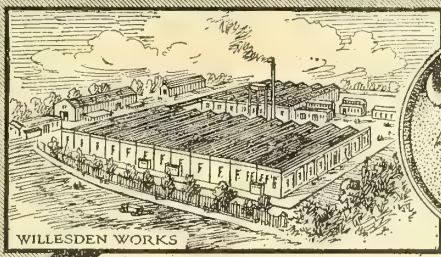
Nevertheless, though he must obtain approval for his operations, he should be sufficiently strong in his position to prevent the Secretary of State from substituting ideas of his own. Half the mischief in this war is distinctly traceable to the interference of civilian ministers in the direct operations of war. It is the province of the statesman to provide the means and the duty of the Chief of Staff to make adequate use of them.

(To be continued.)

Jan., 1918.		lb.
3-4.—Railways near Metz (100,000) .....	760	
4-5.—Railways, near Metz (100,000) .....	2,940	
5-6.—Town, Courcelles (See Metz) .....	1,344	
5-6.—Town and Railway, Conflans (See Metz) ..	2,180	
14.—Munition Factory and Railways, Karlsruhe (140,000) .....	2,800	
14-15.—Steel Works, Diedenhofen (Thionville) (13,000) .....	2,105	
14-15.—Railways, Metz (100,000) .....	524	
14-15.—Railways, Ebdingen (See Metz) .....	280	
16-17.—Railways, Bendsdorf .....	280	
16-17.—Town, Orny .....	255	
16-17.—Searchlight, Vigny .....	25	
21-22.—Steelworks, Diedenhofen .....	1,220	
21-22.—Railway Sidings, Bendsdorf .....	2,210	
21-22.—Railway Junction, Arnaville .....	1,344	
24-25.—Steelworks and Railways, Diedenhofen (13,000) .....	1,120	
Barracks, Trèves (48,200), .....	809	
24-25.—Railway, Oberbillig .....	280	
24-25.—Factory, Mannheim (290,000) .....	672	
24-25.—Railway, Saarburg (9,800) .....	280	
24-25.—Steelworks, Diedenhofen .....	1,344	
27.—Barracks and Station, Trèves (48,000).....	230	
28.—Barracks and Station, Trèves .....	1,350	
Feb.		
9-10.—Railway, Courcelles (See Metz) .....	1,844	
12.—Town, Offenburg (15,400) .....	2,838	
16-17.—Railway Station, Conflans (See Metz) ...	1,488	
17-18.—Railway Sidings, Conflans .....	2,240	
18.—Steelworks and Station, Diedenhofen .....	936	
18.—Barracks and Station, Trèves .....	1,250	
18-19.—Barracks and Station, Trèves .....	2,206	
18-19.—Railway and Gasworks, Diedenhofen .....	650	
19.—Station, Trèves .....	2,400	

[Of these, seven appear to have been made into German territory, and the rest on Elsass-Lothringen, which we hope to liberate from the "Heel of the Hun."—Ed.]



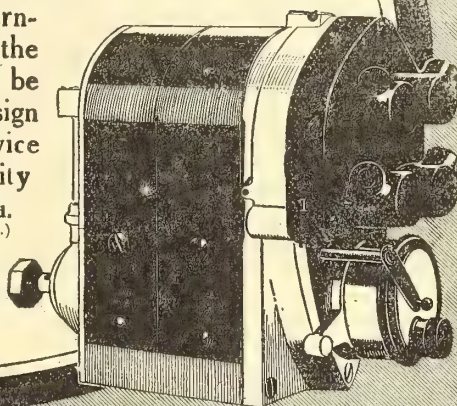


## THE ENTIRE OUTPUT OF B.T.H. MAGNETOS

is at present requisitioned by the Government for war purposes. On the termination of hostilities, supplies will be available for all who value British design and workmanship, reliability in service and the highest standard of Quality

Works - Coventry and Willesden, England.  
(Member of the British Ignition Apparatus Association.)

**THE BRITISH THOMSON-HOUSTON Co., Ltd.**  
Electrical Engineers and Manufacturers.  
Head Office & Works: RUGBY, England.



*The*  
**BRITISH THOMSON-HOUSTON CO. LTD.**  
Electrical Engineers & Manufacturers  
LOWER FORD, ST. COVENTRY, ENGLAND

Member of the *BRITISH IGNITION APPARATUS ASSOCIATION*

## Rotax

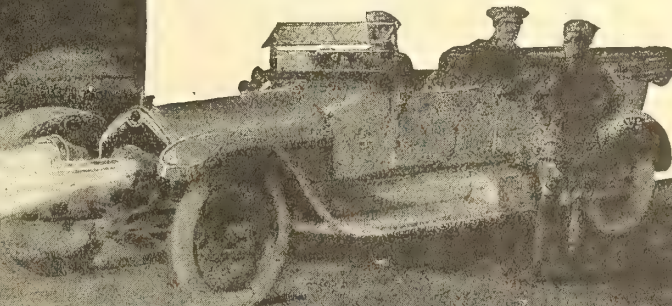
### ROTAX AEROPLANE FITTINGS and ROTAX MOTOR ACCESSORIES

are both made with the same degree of accuracy and reliability that Government requirements call for and service conditions demand.

Special Catalogue of Aero Fittings just published sent on application. Specialities - Electrical Equipment, Streamline Wire and Fittings - Brass and Gunmetal Fittings etc., etc.

**The ROTAX MOTOR ACCESSORIES Co., Ltd.**

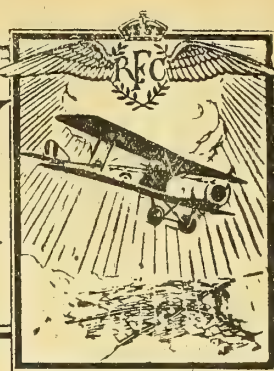
HEAD OFFICES -  
Rotax Works, Willesden Junction, N.W. 10







# NAVAL *and* MILITARY • AERONAUTICS •



## FROM THE "LONDON GAZETTE."

WAR OFFICE, Feb. 19th.

**REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—MIL. WING.**  
—Staff Officer, 1st Cl. (Graded as a G.S.O., 3rd Gr., at the War Office)—Bt. Maj. G. D. Pidgeon, Spec. Res., from a Staff Officer, 2nd Cl. (graded as a Brig. Maj.), and to be temp. Lt.-Col. whilst so empld., Feb. 1st.

Staff Officer, 2nd Cl.—(Graded as a G.S.O., 2nd Gr., at the War Office)—Maj. H. A. Moore, M.C., Lond. R., T.F., Jan. 28th.

**Flying Officers.—Temp. Sec. Lt. (temp. Capt.)** N. E. Barraclough, M.C., Gen. List, reverts from a Flt. Comdr. and relinquishes the rank of temp. Capt., Jan. 26th, seny. from Feb. 18th, 1917.

Capt. J. L. Head, Lond. R., T.F., reverts from Flt. Comdr., Feb. 2nd, seny. from July 9th, 1916.

**OVERSEA CONTINGENTS.—CANADA.—Manitoba R.**—The following officer is secd. for duty with R.F.C.:—Temp. Capt. E. R. Williams.

\* \* \*

The King has been pleased to award the Distinguished Conduct Medal to the undermentioned N.C.O. for gallantry and distinguished service in the field:—

Z151 Cpl. A. H. Mathieson, R.F.C. (Kimberley, S. Africa).

WAR OFFICE, Feb. 20th.

**REGULAR FORCES.—STAFF.**—The following temp. appts. are made at the War Office:—Dir.-Gen. of Mil. Aeronautics.—Bt. Col. (temp. Brig.-Gen.) E. L. Ellington, C.M.G., R.A., from Dep. Dir.-Gen., to retain his temp. rank while so empld., and to remain secd., Jan. 14th.

**ESTABLISHMENTS.—R.F.C.—MIL. WING.**—Chief Experimental Officer.—(Graded as a Park Comdr.)—Capt. R. B. Bourdillon, M.C., Spec. Res., from a Staff Officer, R.F.C., 2nd Cl. (graded as a G.S.O., 2nd Grade, at the War Office), and to be temp. Maj. whilst so empld., Feb. 1st.

**GEN. LIST.**—Lt. W. L. S. Jackson, late temp. Capt., to be temp. Sec. Lt., from Oct. 19th, 1917, to Feb. 9th.

WAR OFFICE, Feb. 21st.

**REGULAR FORCES.—STAFF.**—Attd. to Hqqr. Units.—Comdr.—Bt. Col. (temp. Maj.-Gen.) J. M. Salmond, C.M.G., D.S.O., R. Lanc. Regt., and to retain his temp. rank while so empld., vice Maj.-Gen. Sir H. M. Trenchard, K.C.B., D.S.O., Jan. 18th.

**ESTABLISHMENTS.—R.F.C.—MIL. WING.**—Flt. Condrs.—From Flying Officers and to be temp. Capt. whilst so empld.:—Temp. Sec. Lt. A. B. Coupal, Gen. List, Oct. 1st, 1917. Lt. L. R. Andrews, Canadian Local Forces; Lt. W. C. Gage, Spec. Res., Dec. 1st, 1917. Lt. H. A. B. Robb, M.C., Spec. Res., Jan. 1st.

Park Comdr.—Lt. (temp. Capt.) D. S. Jillings, M.C., W. York R., from an Adj., and to be temp. Maj. whilst so empld., Feb. 1st.

**GEN. LIST.**—The following from R.F.C., to be temp. Sec. Lts.:—Serjt. (Pilot) G. P. Olley, Jan. 28th; Flt. Serjt. C. T. Hoyt, Feb. 4th.

**MEMORANDA.**—Temp. Serjt.-Majs., from R.F.C., to be Sec. Lts. while serving with R.F.C.:—C. A. C. Fidler, F. W. Powell, R. D. G. Macrostie, Oct. 28th, 1917; F. Baker, Jan. 20th.

ADMIRALTY, Feb. 22nd.

The King has been pleased to approve of the award of the following decorations to the undermentioned Officers for services in action with enemy submarines:—

### THE DISTINGUISHED SERVICE CROSS.

Flt.-Lt. J. F. HART, R.N.A.S.

Flt.-Lt. J. E. BARRS, R.N.A.S.

### A BAR TO THE DISTINGUISHED SERVICE CROSS.

Flt.-Comdr. J. G. STRUTHERS, D.S.C., R.N.A.S.

### A SECOND BAR TO THE DISTINGUISHED SERVICE CROSS.

Flt.-Comdr. J. G. STRUTHERS, D.S.C., R.N.A.S.

The King has been pleased to approve of the award of the following honours, decorations and medals to Officers and Men of the Royal Naval Air Service:—

### THE DISTINGUISHED SERVICE ORDER.

Wing Comdr. F. W. BOWHILL, R.N.

In recognition of his invaluable services as Comdg. Officer of the R.N.A.S., employed in connection with military operations in East Africa. It is due to his experience and unceasing labour that his small unit of the R.N.A.S. has been of such assistance to the military operations. He has instilled a high sense of discipline into those under his orders.

### THE DISTINGUISHED SERVICE CROSS.

Flt. Comdr. W. H. DUNN, R.N.A.S.

In recognition of his services whilst employed in connection with military operations in East Africa. He did splendid work during the operations in the Lindi area, and carried out valuable bombing and reconnaissance flights.

Flt. Comdr. G. W. PRICE, R.N.A.S.

In recognition of the gallantry and determination displayed by him in leading offensive patrols, which have constantly engaged and driven away enemy aircraft. On Jan. 2nd, 1918, he observed seven Albatros scouts, and, crossing the lines in the clouds, he attacked one, which fell vertically, bursting into flames, and crashed to the ground. He has on several occasions driven enemy aircraft down out of control.

Flt. Lt. (now Flt. Comdr.) A. M. WAISTELL, R.N.A.S.

For the determination and pluck shown by him in carrying out a bombing raid on Chanak on the night of Oct. 17th, 1917. In spite of the fact that there was no moon and that the weather conditions were so adverse that other pilots were unable to reach the objective, he succeeded in reaching Chanak and dropping his bombs. On the return journey he hit the side of a mountain, being unable to see it on account of the darkness, the machine catching fire on crashing. Although severely injured about the face and knee he was able to climb out of the machine, and eventually reached the aerodrome, having ridden 10 miles over extremely rough country with a badly lacerated knee.

Flt. Lt. (Actg. Flt. Comdr.) N. M. MACGREGOR, R.N.A.S.

In recognition of his skill and courage in aerial combats. On Dec. 12th, 1917, whilst leading his flight on an offensive sweep he encountered a body of six Albatros scouts at 14,000 feet. In the general fight which ensued he attacked a scout which was engaging one of our machines, and drove it down out of control, and it was seen to crash. Actg. Flt. Comdr. Macgregor has destroyed several enemy machines, and has led his flight with great dash and judgment.

Flt. Lt. R. D. DELAMERE, R.N.A.S.

In recognition of the gallantry and devotion to duty shown by him in carrying out reconnaissance, bombing, and photographic flights during the military operations in the Lindi (East Africa) area.

Flt. Lt. S. M. KINKEAD, R.N.A.S.

In recognition of the conspicuous gallantry and skill displayed by him in the face of the enemy in aerial combats, notably on the following occasions:—On Oct. 24th, 1917, he brought down an enemy machine, and immediately afterwards encountered and drove off a group of seven hostile aeroplanes. On Dec. 4th, 1917, he brought down an enemy two-seater machine completely out of control. By his skill and determination in attacking enemy machines he has always shown a fine example to other pilots.

Flt. Lt. J. F. CHISHOLM, R.N.A.S.

In recognition of his services on Dec. 6th, 1917, when he carried out a photographic reconnaissance in the vicinity of Zeebrugge, and for the great skill and determination with which he has carried out his duties at all times.



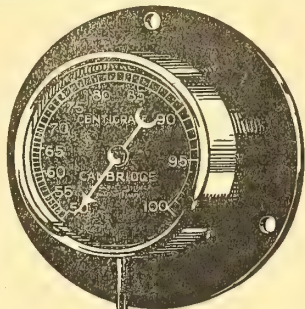
# THE CAMBRIDGE SCIENTIFIC INSTRUMENT CO. LTD

## AEROPLANE

Length of Scale 4"  
Diameter of Dial 2"  
Weight with 10ft of  
Copper Tubing 16ozs.

Length of Copper  
Tubing and Tempera-  
ture range to Cust-  
omer's requirements.

### RADIATOR



### THERMOMETER

Manufacturers of all  
Types of Temperature  
Measuring Instruments  
for Industrial and . .  
Scientific purposes.

## CAMBRIDGE ENGLAND

also  
Aeronautical Instruments  
Engineering Instruments  
Electrical Instruments  
Physical Instruments  
Physiological Instruments

Telegram: INSTRUMENT-CAMBRIDGE

Telephone: CAMBRIDGE No 615 (2 lines)



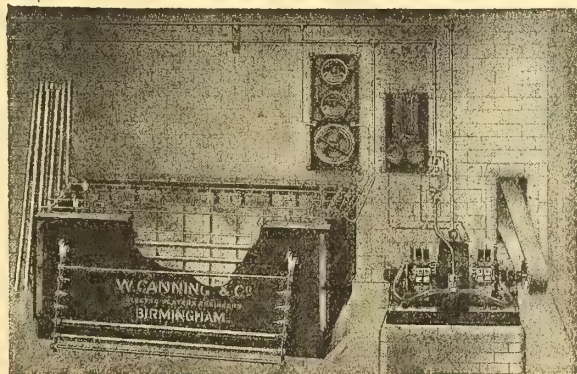
# W. CANNING & CO. *Lustre Works,* Gt. Hampton Street BIRMINGHAM

AND 18/20, ST. JOHN'S SQUARE,  
CLERKENWELL, LONDON, E.C.1.

### MANUFACTURERS OF

Motor Generators, Low Voltage Dynamos, Vats,  
Chemicals, Complete Plant for  
**ELECTRO - ZINCING (COLD GALVANIZING)**

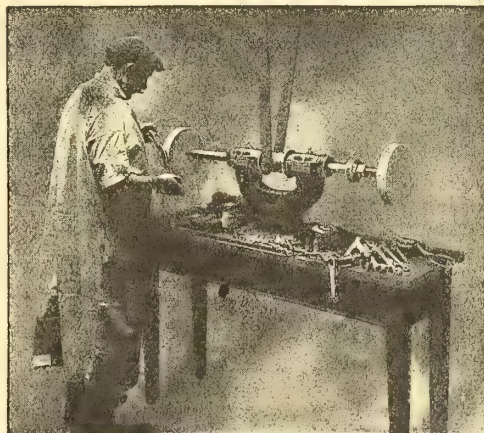
**POLISHING MACHINERY & MATERIALS  
FOR AERO ENGINE & OTHER PARTS.**



For Aeroplane Stay Wires, Connections.

**Also NICKEL, COPPER AND BRASS  
PLATING AND TANNING, &c., OUTFITS.**

Contractors to the British, Colonial, and Foreign  
Governments, Railways and Ship yards.



**POLISHING LATHES**, with Self-Oiling and  
Ball Bearings. EMERY GRINDERS, POLISHING  
MOPS, POLISHING BOBS, POLISHING COM-  
POSITIONS, "LUSTRE" POLISH.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



Lt. E. C. W. FITZHERBERT, R.N.A.S.

In recognition of the valuable services performed by him as observer in the R.N.A.S. during the military operations in East Africa. His reports on the country, enemy positions, etc., and his photographs have been of the greatest assistance to the operations.

Flt. Sub-Lt. R. McN. KEIRSTEAD, R.N.A.S.

In recognition of conspicuous gallantry in aerial combats. On Sept. 24th, 1917, he engaged single-handed four enemy aeroplanes, of which two were destroyed by him. On Oct. 21st, 1917, during an engagement between a British and a German formation, he attacked one of the enemy scouts and shot its port wings away from the rest of the machine. He then dived on to some enemy scouts which were attacking another of our machines and brought one of them down in a spinning nose-dive.

Flt. Sub-Lt. W. L. JORDAN, R.N.A.S.

In recognition of the courage and initiative displayed by him in aerial combats. On July 13th, 1917, in company with another pilot, he attacked an enemy two-seater machine. After bursts of fire from both of our machines, the enemy observer was seen to collapse in the cock-pit, and the enemy aircraft was last seen disappearing among some houses. On Dec. 6th, 1917, whilst patrolling at 15,000 feet, he saw a two-seater enemy aircraft at 10,500 feet, and dived on him, firing about 30 rounds. After falling over to the left, enemy aircraft went down vertically. He has also been instrumental in bringing down other enemy machines.

Flt. Sub-Lt. H. DAY, R.N.A.S.

In recognition of the skill and determination shown by him in aerial combats, in the course of which he has done much to stop enemy artillery machines from working. On Jan. 6th, 1918, he observed a new type enemy aeroplane. He immediately dived to attack, and after a short combat the enemy machine went down very steeply, and was seen to crash. On several other occasions he has brought down enemy machines out of control.

#### THE DISTINGUISHED SERVICE MEDAL

C.P.O., 3rd Gr., H. P. Eustace, O.N. F2486; P.O. T. R. Johnston O.N. J5523 (Dev.).

\* \* \*

The following rating has been mentioned in dispatches:—  
Ldg. Mech. A. G. Furber, O.N. F4979.

\* \* \*

The following Decorations have been conferred by the Allied Powers on the undermentioned Officers of the British Naval Forces for distinguished services rendered during the war. The King has given unrestricted permission to the Officers named to wear the Decorations in question:—

#### CONFERRED BY THE PRESIDENT OF THE FRENCH REPUBLIC.

##### CROIX DE GUERRE.

Flt. Lt. H. V. Worrall, R.N.A.S.; Flt. Lt. A. E. Popham, R.N.A.S.; Flt. Lt. C. G. Bronson, R.N.A.S.; Flt. Lt. E. M. King, R.N.A.S.; Flt. Lt. E. J. P. Burling, R.N.A.S.; Flt. Sub-Lt. G. D. Smith, R.N.A.S.

#### CONFERRED BY THE KING OF THE BELGIANS.

##### ORDER OF LEOPOLD (WITH SWORDS).

CHEVALIER.—Wing Capt. E. L. Gerrard, D.S.O., R.N.A.S. (Maj., temp. Lt.-Col. R.M.L.I.).

##### ORDER OF THE CROWN.

COMMANDER.—Flt. Lt. G. M. T. Rouse, R.N.A.S.; Flt. Lt. E. J. K. Buckley, R.N.A.S. (since killed); Flt. Sub-Lt. L. F. W. Smith, R.N.A.S. (since killed); Flt. Sub-Lt. G. W. Hemming, R.N.A.S.

##### CROIX DE GUERRE.

Flt. Lt. G. M. T. Rouse, R.N.A.S.; Flt. Lt. E. J. K. Buckley, R.N.A.S. (since killed); Flt. Sub-Lt. L. F. W. Smith, R.N.A.S. (since killed); Flt. Sub-Lt. G. W. Hemming, R.N.A.S.

CORRECTIONS.—In "Gazette" of Dec. 19th, 1917, for Obsr. Sub-Lt. William Laurence Hill, R.N.A.S., read Obsr. Sub-Lt. William Laurence Hill Pattisson, R.N.A.S.

#### WAR OFFICE, Feb. 22nd.

REGULAR FORCES—ESTABLISHMENTS—R.F.C.—MIL. WING.—Flt. Comdrs.—From Flying Officers and to be temp. Capts. whilst so empld.:—Temp. Lt. J. T. Collier, Gen. List; Lt. T. M. B. Newton, R. Berks. R., Jan. 1st. Temp. Lt. G. W. Gathergood, Gen. List; Lt. C. J. Chabot, Spec. Res.; Lt. C. S. T. Lavers, W. York R., Spec. Res.; temp. Sec. Lt. (temp. Lt.) G. E. Ransom, attd. R. Fus., and to be transfd. to R.F.C., Gen. List; temp. Lt. A. R. Nock, Gen. List; Lt. J. A. Boret, M.C., R.W. Surr. R., T.F., and to be sec'd.; Lt. P. Thompson, Spec. Res.; Sec. Lt. (temp. Lt.) G. H. Harrison, Midd'x. R., T.F.; Sec. Lt. R. N. Hall, M.C., R.F.A., Spec. Res.; temp. Sec. Lt. A. E. Godfrey, M.C., Gen. List, Feb. 1st.

Equipt. Officers, 1st Cl.—From the 2nd Cl.:—Capt. L. S. Metford, Spec. Res., Dec. 1st, 1917. And to be temp. Capts. whilst so empld.:—Lt. R. E. H. Daniel, Spec. Res.; temp. Lt.

T. N. Gilbert, Gen. List; Lt. T. A. B. Rolfe, Spec. Res., Jan. 1st.

Asst. Instr. in Gunnery.—(Graded as an Equipt. Officer, 2nd Cl.)—Sec. Lt. S. A. Turner, L'pool R., T.F., from an Asst. Instr. in Gunnery (graded as an Equipt. Officer, 3rd Cl.), and to be temp. Lt. whilst so empld., Jan. 22nd.

SCHOOLS OF INSTRN.—SCHOOLS OF MIL. AERONAUTICS.—Instrs.—(Graded as a Flt. Comdr.)—Sec. Lt. (temp. Lt.) R. Collis, E. Surr. R., a Flying Officer, and to be temp. Capt. whilst so empld., May 26th, 1917. (Graded as an Equipt. Officer, 1st Cl.)—Sec. Lt. (temp. Lt.) G. A. Hilliar, Glouc. R., from an Asst. Instr. (graded as an Equipt. Officer, 2nd Cl.), and to be temp. Capt. whilst so empld., May 26th, 1917.

Asst. Instrs.—(Graded as Equipt. Officers, 2nd Cl.)—And to be temp. Lts. whilst so empld.:—Temp. Sec. Lt. H. R. Hare, Gen. List, a Flying Officer (Obsr.): Temp. Sec. Lt. H. Pollard, Gen. List, an Equipt. Officer, 3rd Cl., Dec. 1st, 1917.

SCHOOL OF TECHNICAL TRAINING.—Chief Instr.—(Graded as a Park Comdr.)—Temp. Capt. J. Jensen, Gen. List, from an Instr. (graded as an Equipt. Officer, 1st Cl.), and to be temp. Maj. whilst so empld., Jan. 31st.

Instrs.—(Graded as Equipt. Officers, 1st Cl.), and to be temp. Capts. whilst so empld.:—Sec. Lt. (temp. Lt.) H. E. Steinberg, Spec. Res., from an Instr. (graded as an Equipt. Officer, 2nd Cl.): Sec. Lt. (temp. Lt.) D. Richardson, Spec. Res., from an Asst. Instr. (graded as an Equipt. Officer, 2nd Cl.), Jan. 31st.

ARMAMENT SCHOOL.—Asst. Instr. in Gunnery School.—(Graded as an Equipt. Officer, 2nd Cl.)—The regiment of Capt. P. S. Jackson-Taylor is Hereford R., T.F., and not as in the "Gazette" of Jan. 25th.

Gen. List.—To be temp. Sec. Lts.: 2nd Cl. Air Mech. A.F. Cotton, from R.F.C.; Actg. Serjt. P. Phillips, from R.F.C., Nov. 27th, 1917. 1st Cl. Air Mech. A. C. Edgley, from R.F.C., Nov. 30th, 1917. 2nd Cl. Air Mech. J. B. Bales, from R.F.C.; 2nd Cl. Air Mech. C. F. Pearson, from R.F.C.; 1st Cl. Air Mech. A. P. Dale, from R.F.C., Dec. 3rd, 1917. 2nd Cl. Air Mech. G. F. Greengrove from R.F.C.; 1st Cl. Air Mech. E. Seymour, from R.F.C., Dec. 6th, 1917. 1st Cl. Air Mech. P. B. Whillier, from R.F.C.; 2nd Cl. Air Mech. E. B. Robinson, from R.F.C., Dec. 7th, 1917. Serjt. R. J. H. Holland, from R.F.C.; Serjt. D. S. Mackenzie, from R.F.C., Dec. 8th, 1917.

#### WAR OFFICE, Feb. 23rd.

##### REGULAR FORCES—ESTABLISHMENTS—R.F.C.—MIL. WING.

—Sqdn. Comdrs.—From Flt. Comdrs. and to be temp. Majs. whilst so empld.:—Capt. P. A. O. Leask, R. Ir. Rif.; temp. Capt. J. Blackwood, Gen. List, Nov. 25th, 1917. Lt. (temp. Capt.) H. G. Dean, York and Lanc. R., Dec. 10th, 1917. Lt. (temp. Capt.) A. T. Harris, Spec. Res.; temp. Capt. S. W. Price, M.C., Gen. List; Lt. (temp. Capt.) G. E. O. Osborne M.G.C., Canadian Local Force; Lt. (temp. Capt.) J. K. Aird, Spec. Res.; temp. Capt. N. C. Sampson, Gen. List; Sec. Lt. (temp. Capt.) F. Sowrey, D.S.O., M.C., R. Fus.; Lt. (temp. Capt.) F. V. Woodman, Saskatchewan R.; Capt. A. Somervail, M.C., K.O.S.B., T.F.; temp. Capt. W. Sowrey, Gen. List, Jan. 1st. Capt. R. G. Gould, M.C., Spec. Res., Jan. 19th. Lt. (temp. Capt.) V. A. H. Robeson, Spec. Res., Feb. 1st.

Flt. Comdrs.—From Flying Officers.—Capt. W. B. Crossley, Lanc. Fus., T.F., Sept. 15th, 1917. And to be temp. Capts. whilst so empld.:—Lt. C. Turner, Worc. R., Dec. 14th, 1917. Lt. E. Gribben, M.C., R. Ir. R., Spec. Res., Jan. 1st. Lt. N. G. Caridia, Spec. Res.; Lt. L. M. Barlow, M.C., Spec. Res. (since killed), Jan. 23rd. Lt. J. A. Middleton, R.F.A., T.F., and to be sec'd., Feb. 4th. Lt. F. E. Brown, R. Dub. Fus., Spec. Res., Feb. 6th.

Instr. in Gunnery.—(Graded as an Equipt. Officer, 1st Cl.)—Temp. Lt. H. B. Griffith, Gen. List, from an Asst. Instr. in Gunnery (graded as an Equipt. Officer, 2nd Cl.), and to be temp. Capt. whilst so empld., Jan. 1st.

Asst. Instrs. in Gunnery.—(Graded as Equipt. Officers, 2nd Cl.)—Temp. Sec. Lt. H. A. Heaton, M.C., R. Lanc. R., to be transfd. to R.F.C., Gen. List, and to be temp. Lt. whilst so empld., Dec. 1st, 1917. Capt. M. H. Park, M.C., E. Ontario R., from an Asst. Instr. (graded as an Equipt. Officer, 3rd Cl.), temp. Sec. Lt. E. H. Jones, Gen. List, a Flying Officer (Observer), and to be temp. Lt. whilst so empld., Jan. 1st.

Park Comdr.—Temp. Capt. J. R. Grant, Gen. List, from an Equipt. Officer, 1st Cl., and to be temp. Maj. whilst so empld., Feb. 1st.

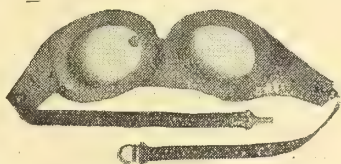
Special Appt.—(Graded as a Park Comdr.)—Lt. (temp. Capt.) H. K. Maxwell, Spec. Res., an Equipt. Officer, 1st Cl., and to be temp. Maj. whilst so empld., Dec. 27th, 1917.

Equipt. Officers, 1st Cl.—From the 2nd Cl., and to be temp. Capts. whilst so empld.:—Lt. H. R. Spence, Spec. Res., Jan. 4th. Temp. Lt. A. B. Wiggins, Gen. List; Lt. C. A. Stevenson, Gen. List; temp. Lt. W. E. Phillips, Gen. List; Sec. Lt. (temp. Lt.) M. F. A. Paine, Spec. Res.; Lt. H. B. FitzHerbert, Spec. Res., Feb. 1st.

Gen. List.—From R.F.C. to be temp. Sec. Lts.:—Temp. Serjt.-Maj. W. A. Baker; Cpl. E. R. Brown, Jan. 19th. Cpl. W. S. Eastaugh, Feb. 2nd. Temp. Serjt.-Majs., from R.F.C.,



Send Him  
a pair of—  
**"TRIPLEX"**  
SAFETY GOGGLES



PRICE:  
**7/6**  
PER  
PAIR

"Triplex" Safety Glass affords complete protection from damage caused by concussion and collision, and is a wonderful safeguard against shrapnel. "Triplex" cannot be splintered—it always remains intact however severely damaged.

The "TRIPLEX" SAFETY GLASS Co. Ltd.

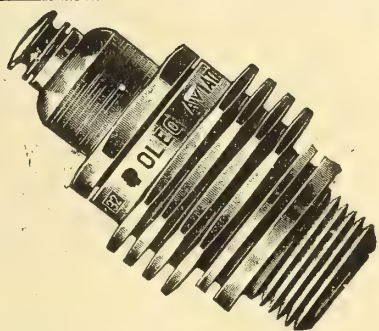
(Reginald Delpech, Managing Director),

1 A. Bemarle St. Piccadilly, London, W.1.

Telephone—1340 Regent.  
Telegrams—"Shatterlys,  
Piccy, London."



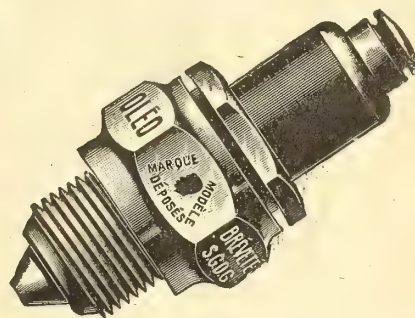
Goggles,  
Windcreens,  
Windows,  
Aeroplane  
Observation  
Panels, etc.,  
should be  
constructed of  
"TRIPLEX"



TYPE No. 32.

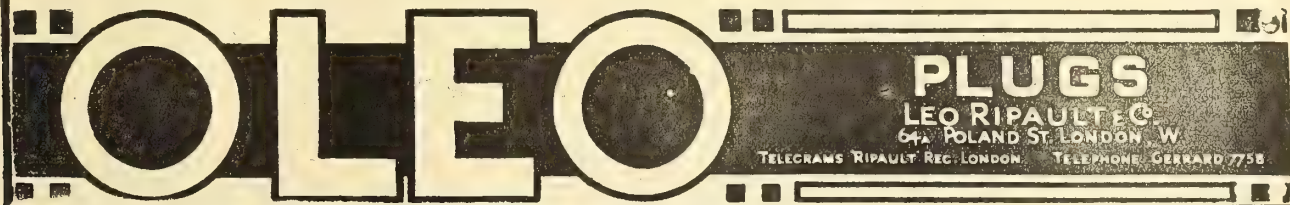


"The Smile of Success."



TYPE No. 27G.

**OLEO were the first Aero Plugs ever made.**  
**OLEO won the Aero Grand Prix SIX TIMES in succession.**  
**OLEO Plugs have been supplied to the Government since 1913.**  
**OLEO Aero Plugs have the "Largest Sale in the World."**  
**OLEO Plugs have won over £30,000 in prizes.**  
**OLEO Plugs were the first to Loop the Loop.**  
**OLEO Plugs were the first to Cross the Alps.**  
**OLEO Plugs are supplied to NINE Governments.**



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



to be temp. Sec. Lts.:—R. J. Tallyn, T. Stevenson, W. G. Mantell, J. A. Cundy, Feb. 1st.

MEMORANDA.—Temp. Serjt.-Majs., from R.F.C., to be Sec. Lts., whilst serving with R.F.C.: J. M. Knight, E. R. Wood, F. V. Wright, Feb. 1st.

The King has been pleased to confer the Military Medal for Bravery in the Field to:—

3697 Serjt. (Flt. Serjt.) N. Moore, R.F.C. (Keighley).

WAR OFFICE, Feb. 25th.

REGULAR FORCES.—STAFF.—ATTACHED TO HDQR. UNITS.—Brig. Comdrs.—The appt. of Capt. (temp. Lt.-Col.) R. R. Smith-Barry, R.F.C., Spec. Res., should be from a Comdt. (graded as a Wing Comdr.), and not as notified in the "Gazette" of Feb. 8th.

ESTABLISHMENTS.—R.F.C.—MIL. WING.—Flt. Comdr.—Lt. N. C. Jones, R.F.A., T.F., from a Flying Officer, and to be temp. Capt. while so empld., Jan. 30th.

Balloon Co. Comdrs.—(Graded as a Sqdn. Comdr.)—Temp. Capt. W. S. Huxley, M.C., Gen. List, from a Balloon Co. Comdr. (graded as a Flt. Comdr.), and to be temp. Maj. whilst so empld.; (Graded as a Flt. Comdr.)—Temp. Lt. J. A. Stevenson, M.C., Gen. List, from a Balloon Comdr. (graded as a Balloon Officer), and to be temp. Capt. whilst so empld., Feb. 4th.

Equipt. Officers, 1st Cl.—From the 2nd Cl., and to be temp. Capt. whilst so empld.:—Sec. Lt. (temp. Lt.) J. E. R. Avery, Spec. Res.; Lt. T. L. F. Burnett, Spec. Res.; Sec. Lt. (temp. Lt.) W. T. Curtis, Spec. Res.; temp. Lt. W. F. Merritt, Gen. List, Jan. 31st.

Examining Officer.—(Graded as an Equipt. Officer, 1st Cl.)—The rank of Temp. Lt. J. Morris, Gen. List, is as now described, and not as in the "Gazette" of Feb. 8th.

SCHOOLS OF INSTRN.—SCHOOLS OF MIL. AERONAUTICS.—Asst. Instr.—(Graded as an Equipt. Officer, 2nd Cl.)—Temp. Lt. F. Tingle, Gen. List, a Flying Officer (Obsr.), Jan. 25th.

SCHOOLS OF AERIAL FIGHTING.—Chief Instr.—(Graded as a Sqdn. Comdr.)—Capt. L. P. Aizlewood, M.C., York and Lanc. R., T.F., a Flt. Comdr., and to be temp. Maj. whilst so empld., Oct. 19th, 1917.

SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—MIL. WING.—Lt. (temp. Capt.) D. A. C. Synnington is placed on the ret. list on account of ill-health contracted on active service, and is granted the hon. rank of Capt.

The King has been pleased to award the Distinguished Conduct Medal to:—

10537 1st Cl. Air Mech. M. H. Church, R.F.C. (Leyton, E.)

#### FROM THE COURT CIRCULAR.

BUCKINGHAM PALACE, Feb. 19th.

Commodore Godfrey Paine (Master-General of Personnel, Air Council) had the honour of being received by His Majesty this evening.

BUCKINGHAM PALACE, Feb. 20th.

The King held an Investiture of the Most Excellent Order of the British Empire at 10.30 o'clock.

The following were severally introduced into the presence of His Majesty, when the King invested them with the Insignia of the respective Divisions of the Order into which they have been admitted:—

RECEIVED THE HONOUR OF KNIGHTHOOD.

KNIGHT COMMANDER.

Lt.-Col. HENRY FOWLER.

OFFICERS.

Wing Comdr. HENRY BUSTEED, R.N.A.S.

Mr. GEORGE COCKBURN.

The following gentleman was present:—Sir Trevor Dawson (Managing Director of Messrs. Vickers, Ltd.)

BUCKINGHAM PALACE, Feb. 21st.

Major-General Sir Hugh Trenchard (Chief of the Air Staff), and Major-General E. B. Ashmore (Commanding London Air Defence Area), had the honour of being received by His Majesty.

BUCKINGHAM PALACE, Feb. 23rd.

The following Officers had the honour of being received by The King, when His Majesty invested them with the Insignia of Companions of the Order into which they have been admitted:—

A BAR TO THE DISTINGUISHED SERVICE ORDER.

Maj. William Bishop, V.C., Canadian Cavalry and R.F.C.

THE DISTINGUISHED SERVICE ORDER AND THE MILITARY CROSS AND BAR.

Capt. Andrew McKeever, R.F.C.

#### NAVAL.

ADMIRALTY COMMUNIQUÉS.

FEB. 19th.—During the night of Feb. 17th-18th naval aircraft carried out bombing raids on Zeebrugge mole and docks, and on docks at Bruges.

Several tons of explosives were dropped. Bombs were observed to fall alongside a submarine shelter and in the vicinity of lock gates and quays.

During the forenoon of Feb. 18th the enemy aerodrome at Varssenaere was attacked. Several direct hits are reported on hangars and sheds.

During the course of offensive patrols three enemy aircraft have been destroyed.

All our machines have returned safely.

On the night of Feb. 18th, bombing raids were carried out by naval aircraft on the following objectives: St. Denis Westrem and Bruges Docks.

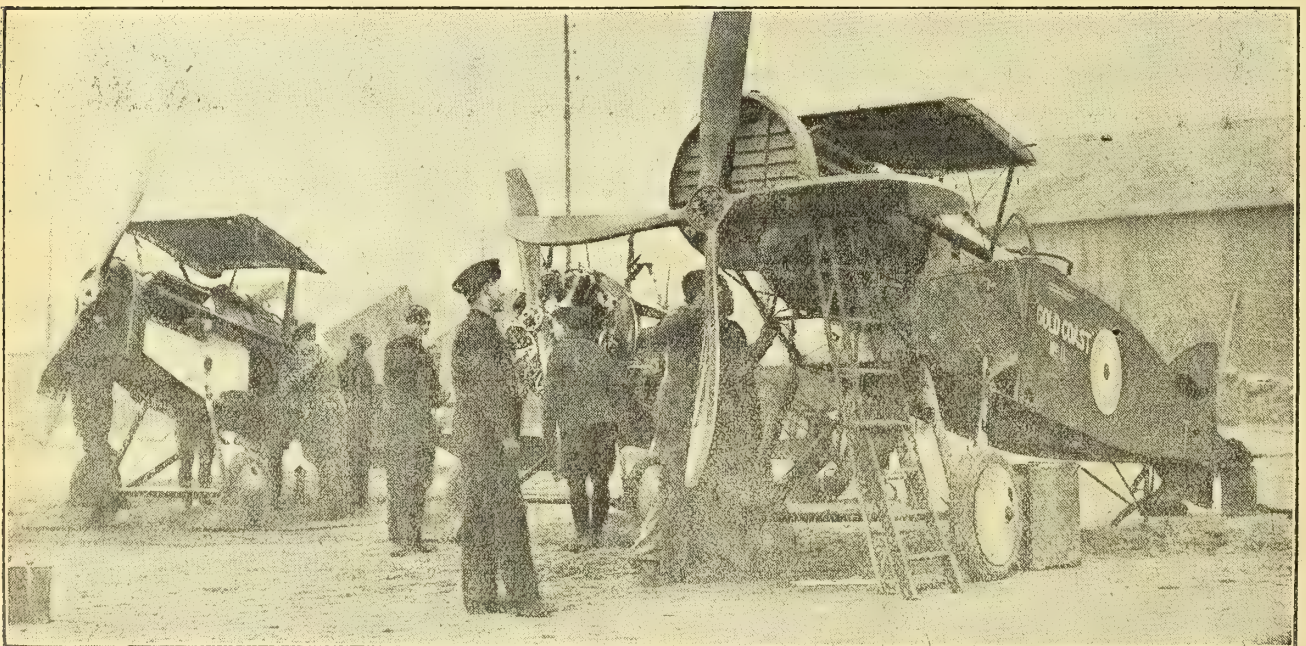
Many tons of explosives were dropped.

A hostile scout which attacked one of our machines was driven down.

To-day (Feb. 19th) a raid was made on Aertrycke aerodrome and Engel dump. Large quantities of explosives were dropped with good results.

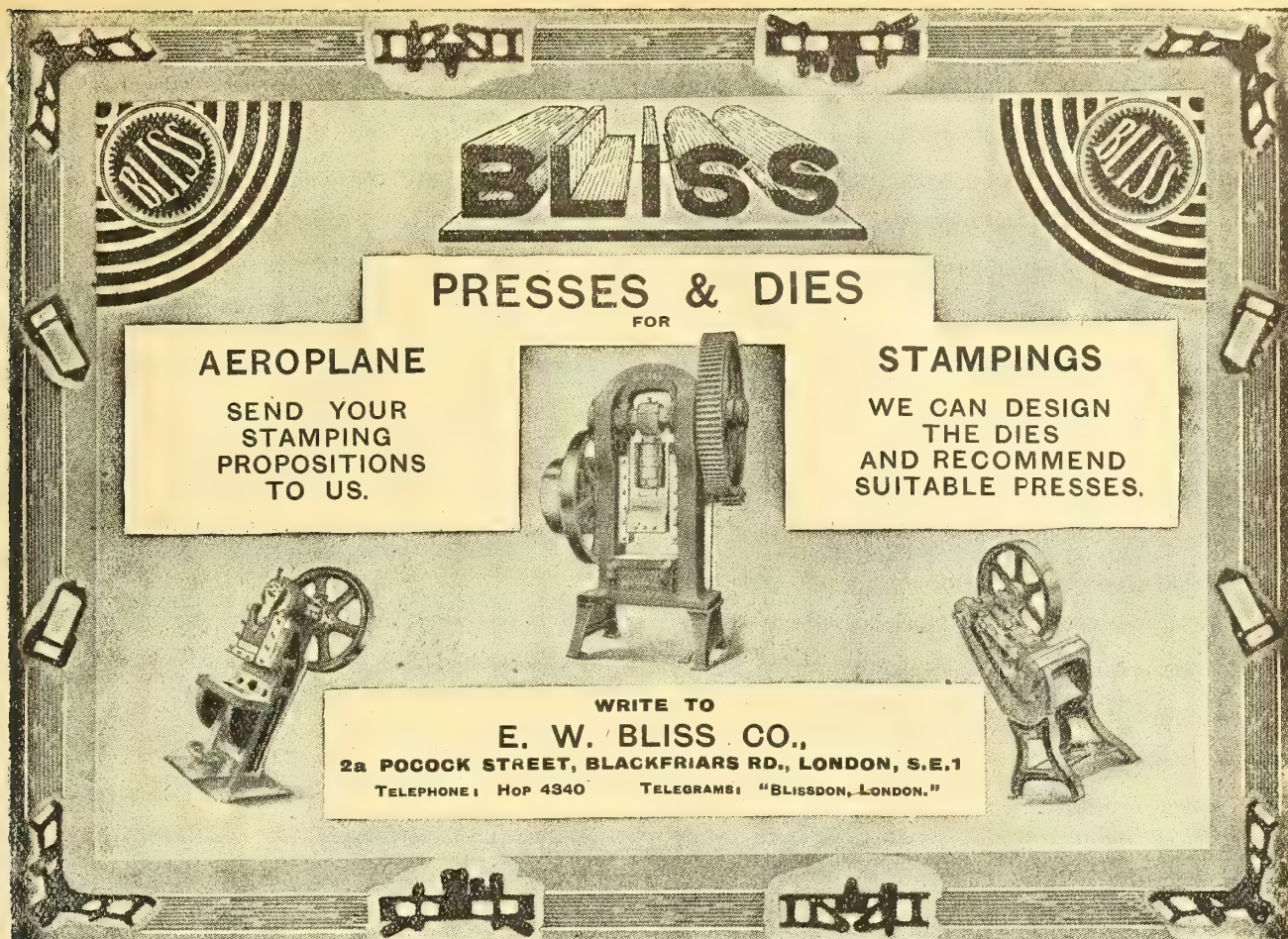
During the course of offensive patrols a hostile seaplane was shot down, and fell in flames into the sea. A scout was brought down on our side of the line, and another machine driven down out of control.

All our machines returned safely.



R.F.C. SALVAGE WORK.—Renovating and re-assembling Aeroplanes. The high efficiency attained at these Depots in France should be an object-lesson to all concerned with aircraft production and the handling of aircraft matériel in this country.





**BLISS**

**PRESSES & DIES**  
FOR

**AEROPLANE**  
SEND YOUR  
STAMPING  
PROPOSITIONS  
TO US.

**STAMPINGS**  
WE CAN DESIGN  
THE DIES  
AND RECOMMEND  
SUITABLE PRESSES.

WRITE TO  
**E. W. BLISS CO.,**  
2a POCKOCK STREET, BLACKFRIARS RD., LONDON, S.E.1  
TELEPHONE: HOP 4340 TELEGRAMS: "BLISSDON, LONDON."

Telephones: DALSTON 872.

LONDON WALL 9766.

HAMPSTEAD 4768.

# Thames Aviation Works

(BURTON'S, LTD.)

TWO COMPLETE MILL PLANTS AND TWO YEARS' EXPERIENCE.

Addresses of our fine Saw Mills, Works, etc.,  
— have been camouflaged by the Censor. —

Offices only: 141, CURTAIN ROAD, E.C.

CONSTRUCTORS OF COMPLETE AIRCRAFT

And all kinds of WOOD PARTS, WINGS, AILERONS,  
— STRUTS, LEVERS, RUDDERS, NACELLES, &c. —

Specialities—BIG STUFF and BEST WORK.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



## THE CASUALTY LIST.

Reported Feb. 21st.

MISSING (FEARED KILLED).—Purdy, Flt. Lt. C. C., R.N.

WOUNDED.—Smith, Flt. Sub-Lt. G. O., R.N.

Reported Feb. 23rd.

KILLED.—Wallworth, Flt. Sub-Lt. C. R. C., R.N.

ACCIDENTALLY KILLED.—Gullett, Proby, Flt. Officer A. E., R.N.

DIED OF WOUNDS.—Burr, Flt. Sub-Lt. R. E., R.N.

MISSING.—Prince, Flt. Comdr. G. W., R.N.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER.—Beat-  
tie, Flt. Sub-Lt. A. G., R.N.

## PERSONAL NOTICES.

## DEATH.

CHAPMAN.—Flt. Lt. C. H. Murray Chapman, R.N., who was accidentally killed whilst flying on Feb. 23rd, was the husband of Olive Murray Chapman and elder son of Mr. and Mrs. Capel Chapman. His seniority was June 30th 1917. He was 25 years of age.

## BIRTHS.

FITZ HERBERT.—On Feb. 19th at Broomfield, Hoylake, Cheshire, Kitty (*née* Lowndes), the wife of Flt. Lt. C. H. Fitz-Herbert, R.N., of a daughter.

SHEPHERD.—On Feb. 21st, at a nursing home, 7, Milton Road, Eastbourne, to Acting Wing Comdr. Philip Shepherd, R.N., and Mrs. Shepherd—a daughter.

Flt. Sub-Lt. Eric A. Bennetts, R.N.A.S., has been missing since Aug. 17th 1917. Any news of him would be gratefully received by his relative Mrs. Watts Russell, Roydon, Launceston, Cornwall.

## MILITARY.

## G.H.Q. COMMUNIQUÉS.

FEB. 19th, 9.35 p.m.—On the 18th inst. the weather was very fine, but visibility was not so good as on preceding days. This did not prevent our aeroplanes from carrying out much useful work in conjunction with the artillery, and taking many photographs in the enemy's forward and back areas.

A hostile aerodrome north of Douai, a large ammunition dump near Courtrai, a railway station south-east of Douai, and the enemy's billets on various parts of the front were bombed by us during the day.

Continuous fighting took place, resulting in 11 hostile machines being brought down and six others driven down out of control.

Two of our aeroplanes are missing.

At night a thick mist set in, but our machines, nevertheless, succeeded in making several short trips behind the enemy's lines, and dropped bombs on hostile billets and railway stations.

Following on the successful daylight raids on the 18th inst. against Trèves and Thionville, our night-flying squadrons went out after dark and again attacked these towns from a low height with equally good results.

Five bursts were observed on Trèves station, which broke into flames. Three other buildings were alight when our machines left.

In the second raid on Thionville, bursts were seen on the railway and in the gasworks. A large fire was started which was visible to the pilots attacking Trèves.

German aircraft and anti-aircraft guns were very active during both raids.

One of our machines failed to return.

On the 19th inst. another raid in broad daylight, making the third within 36 hours, was carried out by us against Trèves. On this occasion well over a ton of bombs were dropped on the objective. Eleven bursts were observed on the railway station and six on buildings in close proximity to it. Three good fires were started.

Our machines were repeatedly attacked by hostile scouts, which were driven off. Anti-aircraft gun fire also was considerable.

One of our machines is so far unaccounted for.

FEB. 20th, 9.36 p.m.—The fine weather of the last few days continued on the 19th instant. Visibility, however, was not good, and prevented much work being done by our aeroplanes with the artillery. It did not interfere with photography, and many photographs were taken of the enemy's aerodromes and other important objectives.

A hostile aerodrome north of Douai and a large ammunition dump north-east of Lille were heavily bombed by us during the day, and in addition fifty bombs were dropped on the enemy's billets.

In air fighting eleven hostile machines were brought down and one other was driven down out of control.

A German night bombing machine also was brought down in No Man's Land by our infantry.

Two of our aeroplanes are missing.

At night visibility remained bad, the greater part of the front being enveloped in thick mist. Over 150 bombs were dropped

by us, however, on an important hostile railway centre south-east of Cambrai and on billets north of Douai.

On the night of the 19th-20th inst. Thionville was again successfully attacked by our machines. Twenty-six heavy bombs were dropped on the railway station. All bombs were seen to explode on and around the objective, and a large explosion was caused and two fires started.

The enemy's anti-aircraft gun fire was again considerable, but all our machines returned safely.

On the 20th instant our aeroplanes bombed the large factories and the station at Pirmasens, in Germany. A ton of bombs was dropped, and hits were obtained near the station, the gas works, and the factories, where a large fire was started.

All our machines returned.

FEB. 21st, 9.42 p.m.—On the 20th inst. the recent spell of fine weather broke. With the exception of a few flights, carried out by our machines to give observation for the artillery, no flying was done.

FEB. 22nd, 8.58 p.m.—The weather improved on the 21st instant, and our aeroplanes were able to accomplish a full day's work in the air.

Many successful reconnaissances, in the course of which photographs were taken, were carried out. The usual work in conjunction with the artillery continued all day, good visibility enabling excellent results to be obtained.

Over 300 bombs were dropped by us on the enemy's billets and on railway sidings at Courtrai, Ledeghem and south-east of Douai.

In air fighting, seven hostile machines were brought down and two others driven down out of control.

Three of our machines are missing.

During the night of the 21st-22nd instant, our aeroplanes dropped a total of 678 bombs on various targets.

Three hundred bombs were dropped on an aerodrome south-east of Le Cateau used by the enemy's night bombing squadrons. Nineteen direct hits were observed on hangars.

The remaining bombs were dropped on hostile aerodromes in the neighbourhood of Ghent and Tournai, and on billets.

One of our machines failed to return.

FEB. 23rd, 9.3 p.m.—On the 22nd instant, with the exception of a few flights in co-operation with the artillery, no work in the air was possible owing to bad weather.

FEB. 24th, 9.22 p.m.—On the 23rd instant bad weather again prevented much flying being done. A little observation work was carried out by our aeroplanes in co-operation with the artillery, and some bombs were dropped in the enemy's forward areas.

During the night, 23rd-24th inst., bombs were dropped by us on three hostile aerodromes in the valley of the River Lys.

All our machines returned.

FEB. 25th, 9.10 p.m.—On the 24th inst., in spite of bad weather, our aeroplanes carried out one or two reconnaissances and observed for the artillery.

Bombs were dropped by us on various targets, including hostile billets, transport, and working parties.

Two of our machines are missing.

After dark, our night-flying squadrons dropped over 200 bombs on hostile aerodromes near Courtrai and on billets north-east of St. Quentin.

All our machines returned.

## WAR OFFICE COMMUNIQUÉS.

FEB. 21st.—The G.O.C. British Forces in Palestine reports:—

Co-operating with this advance, our Air Service carried out effective bombing attacks against the enemy camps and depots on the left (east) bank of the Jordan about Shunet Nimrin (10½ miles east-north-east of Jericho).

FEB. 22nd.—The G.O.C. British Forces in Italy reports:—

Our aeroplanes have carried out several successful bombing raids and destroyed an enemy dirigible shed. The enemy continues to bomb back areas and towns when weather at night permits. Two of his machines have been destroyed recently in returning.

Since the British force arrived our Flying Corps have destroyed 58 hostile machines, principally German, while we have lost only eight. Many other hostile machines have been driven down out of control.

FEB. 22nd.—The G.O.C. British Forces in Macedonia reports:—

Our aircraft co-operated by bombing gun emplacements and trenches.

## HOME COMMAND COMMUNIQUÉS.

FEB. 19th, 12 a.m.—No casualties or damage were caused in last night's air raid.

FEB. 20th.—The total casualties caused in the air raid of the night of Feb. 17th-18th were:—

Killed, 19.

Injured, 34.

## THE CASUALTY LIST.

Reported Feb. 20th.

WOUNDED.—Hunt, Sec. Lt. F. R., R.F.C.

MISSING.—Manley, Sec. Lt. G. A. C., R.F.C.

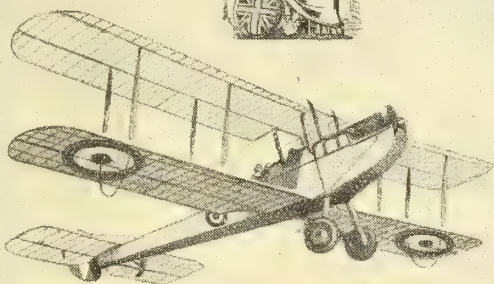


# Britannia Dope

TRADE



MARK



## Britannia Dopes (NON-POISONOUS) and Varnishes

FOR AEROPLANES  
AND SEAPLANES



FOR FULL PARTICULARS APPLY  
TO THE APPROVED MAKERS—

**ROBT. INGHAM  
CLARK & CO. LTD.**

WALTER HOUSE,  
BEDFORD ST., STRAND, W.C.

Telegrams: "Pearline, Westland."  
Telephone: Regent 3923.

WORKS .. WEST HAM ABBEY, E.15  
Tel. phone ... East 955 & 956

# PULVO



1914.



1916.



1918.

.....and that's  
the way we grow.

*Finding our present premises insufficient for our ever-increasing work we have just taken an additional building at 95 & 97, High Holborn.*

*The new premises will be mainly devoted to the making of Radiator Shutters, whilst at our old building we shall be able to turn out small parts in still larger quantities than hitherto.*

*We grow because our customers realise that our work is accurate, reliable, and delivered to time. Are we doing anything for you? We ought to be. Write to-day and let us quote for some of the things you are wanting.*

YOU WANT THE BEST WORK—  
WE DO IT.

**The PULVO ENGINEERING Co. Ltd.**  
10, 12, 14 and 16, DANE STREET,  
—and 95 and 97,—  
HIGH HOLBORN, LONDON, W.C.1

Telephone :  
Holborn 410

Telegrams :  
Pulvult, West-Cent.



Reported Feb. 21st.

MISSING.—Fielding-Clarke, Sec. Lt. A., R.F.C.  
Swart, Sec. Lt. O. B., R.F.C.  
AUSTRALIAN FORCE.—PREVIOUSLY REPORTED MISSING, NOW RE-  
PORTED KILLED.—Clark, Sec. Lt. D. G., Fl. Corps.  
DIED OF WOUNDS.—Nelson, Lt. E. B., Fl. Corps.

Reported Feb. 22nd.

KILLED.—McLean, Lt. D. G., R.F.C.  
PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—  
Bush, Lt. J. C., M.C., Dorset R., attd. R.F.C.  
Chapman, Lt. W. W., Buffs, attd. R.F.C.  
Davies, Lt. D. B., R.F.C.  
Glover, Lt. A. M. T., K.O.S.B., attd. R.F.C.  
Hartnett, Lt. M. C., R. Muns. Fus., attd. R.F.C.  
Hicks, Sec. Lt. H. R., R.F.C.  
Parker, Lt. W. L. O., Hrs., attd. R.F.C.  
Salter, Sec. Lt. J. H. R., R.F.C.  
Sidney, Sec. Lt. L. P., K.R.R.C., attd. R.F.C.  
MISSING.—Gore, Sec. Lt. F. D. C., R.F.C.  
PREVIOUSLY REPORTED PRISONERS, NOW REPORTED WOUNDED AND  
PRISONERS IN GERMAN HANDS.—Calvert, Sec. Lt. T. W.,  
R.F.C.  
Chapman, Sec. Lt. J., High. L.I., attd. R.F.C.  
Denison, Sec. Lt. E. B., R.F.C.  
Garratt, Sec. Lt. J. C., R.F.C.  
Logan, Capt. R. A., R.F.C.  
Phelan, Sec. Lt. R. S., R.F.C.  
Taylor, Lt. S. H., R.F.C.  
Young, Lt. J. G., Leins. R., attd. R.F.C.  
INDIAN FORCES.—PREVIOUSLY REPORTED MISSING, NOW REPORTED  
KILLED.—Cubbon, Capt. F. R., M.C., I.A., Inf., attd.  
R.F.C.

Reported Feb. 23rd.

KILLED.—Dale, Lt. R. J. N., Manch. R., attd. R.F.C.  
Todd, Sec. Lt. F. G., Glouc. R., attd. R.F.C.  
PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—  
Bacon, Lt. E. S., R.F.A., attd. R.F.C.  
Coomber, Capt. H. B., Manch. R., attd. R.F.C.  
PREVIOUSLY REPORTED MISSING, NOW REPORTED DIED OF WOUNDS  
AS A PRISONER IN BULGARIAN HANDS.—Gubbin, Sec. Lt. J.  
R. F., R.F.C.  
PREVIOUSLY REPORTED WOUNDED AND PRISONER, NOW REPORTED  
DIED OF WOUNDS AS A PRISONER IN GERMAN HANDS.—Gray,  
Sec. Lt. G. R., R.F.C.  
PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN  
GERMAN HANDS.—Dogherty, Sec. Lt. F. W., R.F.C.  
Ohrt, Sec. Lt. F. M., R.F.C.  
Peile, Sec. Lt. A. H., R.F.C.

Reported Feb. 25th.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—  
Laing, Sec. Lt. J. D., R.F.C.  
Smith, Sec. Lt. W. R. S., R.F.C.  
ACCIDENTALLY KILLED.—Harding, Lt. C. H., Som. L.I., attd.  
R.F.C.  
WOUNDED.—Bean, Capt. H. H. W., R.F.C.  
PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER IN  
TURKISH HANDS.—Pakenham-Walsh, Lt. L. H., Ches. R.,  
attd. R.F.C.  
CANADIAN FORCES.—KILLED.—Andrew, Lt. W. B., Cent. Ont.  
R., attd. R.F.C.  
PREVIOUSLY REPORTED MISSING, NOW REPORTED BY THE GERMAN  
GOVERNMENT KILLED OR DIED OF WOUNDS.—Gould, Lt. L.  
H., B.C.R., attd. R.F.C.

Reported Feb. 16th.

KILLED.—Hughes, Lt. T. McK., K.R.R.C., attd. R.F.C.  
DIED OF WOUNDS.—Shelton, Capt. K., Buffs, attd. R.F.C.  
WOUNDED.—Mitchell, Lt. A. A., R.F.A., attd. R.F.C.  
MISSING.—Crawford, Sec. Lt. O. G. S., R.F.C.  
Sibley, Capt. S. J., R.F.C.

## CASUALTIES AMONG N.C.O.s AND MEN.

THE DATES ARE THOSE OF THE OFFICIAL LIST.

## KILLED.

FEB. 12th.—R.F.C.—Collingham 67753 2nd Cl. Air Mech. W. G.  
B. (Brighton).

## DIED.

FEB. 13th.—R.F.C.—Bainbridge 3795 1st Cl. Air Mech. A. E.  
(Acomb).  
FEB. 16th.—R.F.C.—Reece 99468 2nd Cl. Air Mech. T. G.  
(Shrewsbury).

## DROWNED.

FEB. 12th.—R.F.C.—Clark 32897 2nd Cl. Air Mech. G. (Leeds).

## MISSING, BELIEVED DROWNED.

FEB. 14th.—R.F.C.—Brotherton 16851 1st Cl. Air Mech. J.  
(Leyland); Carroll 81833 2nd Cl. Air Mech. A. S. S. (Blackpool);  
Dilley 58685 2nd Cl. Air Mech. F. J. (Regent's Street, W.);  
Frank 56534 2nd Cl. Air Mech. F. A. Stamford Hill, N.); Gray  
27249 1st Cl. Air Mech. S. G. (Tottenham, N.); Handscombe  
64199 2nd Cl. Air Mech. H. E. (Waltham Cross); Hatton 80043  
2nd Cl. Air Mech. W. C. (Oxford); Jones 85472 2nd Cl. Air  
Mech. W. (Bognor); Keyte 26050 1st Cl. Air Mech. J. H. (Pad-

dington, W.); Ladd 22942 1st Cl. Air Mech. H. E. (Eden  
Bridge); Laycock 75208 2nd Cl. Air Mech. R. C. (Leeds);  
Matthews 54724 2nd Cl. Air Mech. J. (Beaworthy); Meade  
81559 2nd Cl. Air Mech. R. (Lydeard St. Lawrence); Moore,  
89865 2nd Cl. Air Mech. A. L. (Edmonton, N.); Murrell 16987  
1st Cl. Air Mech. G. (Hackney Road, E.); Nicholls 106748  
Cpl. H. J. (Muswell Hill, N.); Power 85341 2nd Cl. Air Mech.  
M. (Fermoy); Shepherd 82007 2nd Cl. Air Mech. J. N. (Grange-  
over-Sands); Standing 81560 2nd Cl. Air Mech. J. B. (Bethnal  
Green, E.); Walker 81678 2nd Cl. Air Mech. J. (Stoke Newing-  
ton, N.); Youngs 64131 2nd Cl. Air Mech. T. (City Road, E.C.).

## WOUNDED.

FEB. 13th.—R.F.C.—Haggart 42079 2nd Cl. Air Mech. A.  
(West Vancouver).

## MISSING.

FEB. 16th.—R.F.C.—Lee 107629 2nd Cl. Air Mech. R. F.  
(Devonport).

PREVIOUSLY REPORTED WOUNDED, NOW REPORTED NOT WOUNDED.

FEB. 12th.—R.F.C.—Carr 11954 2nd Cl. Air Mech. G. P.  
(Gillingham).

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS OF  
WAR IN GERMAN HANDS.

FEB. 15th.—R.F.C.—Leach 87657 1st Cl. Air Mech. G. (Hyde,  
Cheshire).

FEB. 16th.—Holman 45286 2nd Cl. Air Mech. W. (Willesden  
Lane, N.W.).

## AUSTRALIAN IMPERIAL FORCE

## DIED.

FEB. 12th.—A.F.C.—Kenning 336 T.

## PERSONAL NOTICES.

## ENGAGEMENTS.

HIGSON—STORR.—A marriage has been arranged, and will  
take place at 11.45 on March 6th at Holy Trinity Church, Dar-  
lington, between Lt. Aubrey W. Higson, A.S.C., attd. R.F.C.,  
youngest son of Mr. Jacob Higson, of Rossland, Northwood,  
Middlesex, and Vera Marguerite, youngest daughter of Walter  
W. Storr, J.P., of Uplands, Darlington.

JEFFERSON—CHESHIRE.—The marriage arranged between  
Acting Major E. B. B. Jefferson, the King's Liverpool Regt.  
and R.F.C., son of Mr. and Mrs. T. E. Jefferson, Ballahott, Isle  
of Man, and Muriel, eldest daughter of Mr. and Mrs. J. Holland  
Cheshire, of Hallwood, Neston, Cheshire, will take place in April  
at the parish church, Neston.

## MARRIAGES.

ABBOTT—MARMION.—On Feb. 21st, at the Church of the  
Holy Rosary, 2nd Lt. Valentine A. R. Abbott, A.F.C., son of  
Mr. and Mrs. Arthur Abbott, of Perth, Western Australia, was  
married to Daphne, youngest daughter of the late Hon. W. E.  
Marmion and Mrs. Marmion, of Western Australia, by the Rev.  
Father Tubbs, Rector.

BEWES—SQUIRE.—On Feb. 18th, at All Saints, Southend-  
on-Sea, Lt. Arthur George Bewes, R.F.C., was married to  
Gladys Mary Squire, daughter of Mr. George Edward Squire,  
High View, The Cliff, Westcliff-on-Sea.

DORE—MAUND.—The marriage between Maj. Alan Dore,  
D.S.O., Worcester Regt. and R.F.C., son of Mr. and Mrs. S.  
L. Dore, of Pinner Hill, Pinner, and Mièle, elder daughter of  
Mr. and Mrs. E. A. Maund, of Frognal, Hampstead, took place  
quietly on Feb. 20th, at the parish church, Hampstead, the  
Bishop of Willesden officiating.

FELL—MERTON.—On Feb. 4th, at St. Mary, Boltons, Lt.  
Maurice Anthony Hunter Fell, N.Z.R.B., attd. R.F.C., was mar-  
ried to Gladys Merton, younger daughter of Mr. George Merton,  
Christ's College, Christchurch, New Zealand.

GREVILLE—PAPE.—The wedding took place in Little East-  
on Church, on Feb. 19th, of the Hon. Maynard Greville, R.F.C.,  
younger son of the Earl and Countess of Warwick, and Dora,  
only daughter of the late Edward Pape, of Moor Hall, Battle,  
and 26, Portland Place, and Mrs. Pape.

The Rev. R. Gwynne officiated, and the bride was given away  
by her eldest brother, Lt. E. L. Pape, R.F.C. Lady Mercy Gre-  
ville was bridesmaid and Lt. R. Joynson-Hicks, R.F.C., best  
man.

Among those present were the Earl and Countess of Warwick,  
Brigadier-General Lord Brooke, Lady Marjorie Beckett, Mr. J.  
Pape, Mr. W. C. Theobald, and Mr. and Mrs. H. G. Wells.

The bride and bridegroom afterwards left for Warwick Castle.  
LEES—RUSSELL-JONES.—The marriage between Sec. Lt.  
G. S. E. Lees, A.F.C., only son of the late Hon. S. E. and Mrs.  
Lees, of Sydney, Australia, and Miss Doris Russell-Jones, eldest  
daughter of the late L. C. and Mrs. Russell-Jones, of Sydney,  
Australia, took place very quietly on Monday, Feb. 18th, at St.  
Andrew's Church, Westminster. The bride was given away by  
her brother, Lt. J. Russell-Jones, and Mr. E. L. Rees was best  
man.

SWAIN—HILLMAN.—On Feb. 16th, at the Church of the  
Sacred Heart, Howe, Lt. Claude Swain, R.F.C., elder son of  
Capt. Swain, R.A., of Beech Grove, Haylands, Ryde, was mar-



## IMPERIAL WAR EXHIBITION

### "Guardian Angel" Parachute.

THROUGH a regrettable mistake an ordinary service Parachute has been inadvertently exhibited and catalogued in this Exhibition under the above description.

An "A" type Guardian Angel Parachute supplied by E. R. Calthrop's Aerial Patents, Ltd., for use with aeroplanes and aircraft has now been added to the Exhibition.

Owing to the proceeds of the Exhibition being devoted to the British Red Cross Society's Funds it has been visited by very large numbers of the public and of the Flying Services, who may have been led to misapprehend the characteristics of the Guardian Angel Parachute, which differs fundamentally in construction and action from the Service pattern and all other parachutes.

SECRETARY,

IMPERIAL WAR EXHIBITION,

Jan. 31st, 1918.

Burlington House.

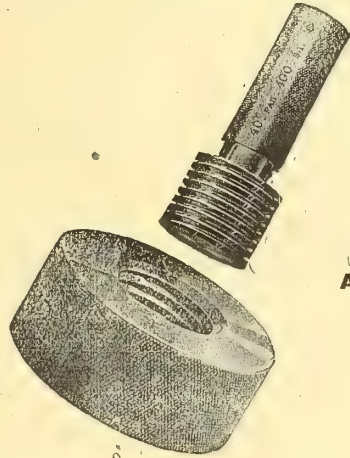
## LIMIT GAUGES

AS SUPPLIED TO

### A.I.D.

AND

THE MINISTRY OF MUNITIONS.



**ABSOLUTE  
ACCURACY.**

Particulars from

**LEO. RIPAUT & CO., 64a, POLAND ST., LONDON, W.1**

Wires—Ripault, London.

'Phone—Gerrard 7758.

# AEROPLANE

We are making  
various Parts for  
Aeroplane Construc-  
tion, including—

Tubes and Tubular Con-  
struction. Sheet Metal Pressed  
Parts. Wheel Rims and Special  
Sections in Steel of any length,  
gauge or width. Brazing, Acety-  
lene, and Electric Welding, etc.

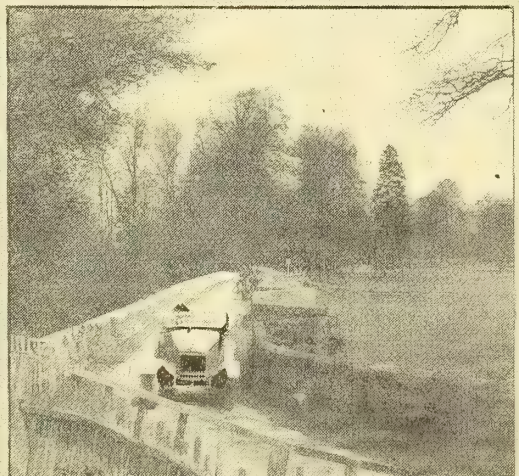
We can also make any Special Parts  
to instructions. Send us your  
enquiries.

**THE LOMBARD  
RIM & TUBE CO.,**

Lombard Street,  
BIRMINGHAM.

# PARTS

## STANDARD LIGHT CARS



WRITE US FOR DETAILS

**THE STANDARD MOTOR CO. LTD.**  
**COVENTRY.**

LONDON AGENTS: THE PYCHLEY AUTOCAR CO. LTD. 216 GASTPORTLAND ST. W.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



ried to Iris, elder daughter of Mrs. Bernard Hillman, 33, First Avenue, Hove, by the Rector, Mgr. Canon Ottley.

**STAMMER—MUSKETT.**—At St. Mary Abbot's Church, on Feb. 25th, Capt. Sidney Robert Stammers, R.F.C., eldest son of Mr. and Mrs. S. J. R. Stammers, of Beaconsfield, Gunnersbury, was married to Muriel, only daughter of Mr. and Mrs. H. G. Muskett, Gerrard's Cross, Bucks. The Rev. P. W. Moulton conducted the service. The bridesmaid was Miss Vera Stammers (sister of the bridegroom), and Capt. Trygve Gran, the Norwegian aviator, now R.F.C., was best man.

#### BIRTHS.

**ARMSTRONG.**—On Feb. 19th, 1918, at The Croft, Highclere, near Newbury, Berks, to Sec. Lt. Guy W. Armstrong, R.F.C., and Mrs. Armstrong—a son.

**EVERITT.**—On Feb. 21st, at Littlefield, St. George's Hill, Weybridge, the wife of Major S. O. Everitt, R.F.C. (late Leicestershire Regt.), of a daughter.

**GORDON.**—On Feb. 22nd, 1918, at 89, Lower Baggot Street, Dublin, the wife of Major H. F. A. Gordon, York and Lancaster Regt. and R.F.C., of a son.

**HOPKINS.**—On Feb. 16th, at The Cedars, Ebley, Glos., the wife of Lt. J. R. Hopkins, R.F.C., of a son.

**RABAGLIATI.**—On Feb. 20th, at Burton Cliff House, Lincoln, to Lieut.-Col. and Mrs. C. E. C. Rabagliati, R.F.C.—a daughter.

**WADHAM.**—On Feb. 20th, at 14, Queen Square, Bath, to Barbara, wife of Lt. N. W. Wadham, Rifle Brigade and R.F.C., a son.

The following officers and soldier, who were prisoners of war in Germany, have arrived in Holland for transfer to England:—

**FREW,** Sec. Lt. J. G. H., R.F.C.

**SUTCLIFFE,** Sec. Lt. A. L., S. Staff. R., attd. R.F.C.

**R.F.C.**—Foulsham, 87650 H. S.

[PRESSURE ON SPACE HAS MADE IT NECESSARY TO HOLD OVER ALL OBITUARY NOTICES THIS WEEK.]

#### FRANCE.

##### OFFICIAL COMMUNIQUÉS.

**FEB. 19th.**—During the days of Feb. 16th, 17th and 18th, our pilots brought down, or seriously damaged, in the course of numerous fights, 18 German machines. In addition, an enemy captive balloon was burnt.

During the day of Feb. 16th and the following night, our bombarding squadrons dropped 16,000 kilograms (16 tons) of explosives on enemy objectives, notably the railway stations of Metz-Sablons, Forbach, and Bensdorf, and the dépôts at Enssheim (all in Germany), where a big fire broke out, as well as on different aerodromes.

**FEB. 20th.**—On the 19th, four German aeroplanes were brought down by our pilots. A fifth machine was destroyed by our anti-aircraft guns.

Three other enemy aeroplanes fell in their own lines, badly damaged, after air fights.

**FEB. 21st.**—On the 20th our pilots brought down three German aeroplanes and forced two other machines to descend in their own lines in a seriously damaged condition. An enemy captive balloon was set on fire.

**FEB. 23rd.**—During the period from Feb. 11th to Feb. 20th, 16 German aeroplanes and two captive balloons were destroyed by our battle-pilots. Four other aeroplanes were brought down by the fire of our anti-aircraft guns during the same period, in addition to 21 enemy machines seriously damaged in air fights which fell behind their lines.

**FEB. 24th.**—A captive balloon was brought down by our artillery.

**FEB. 25th.**—**ARMY OF THE ORIENT.**—On the western part of the front a violent storm prevented any fighting. Allied aviators bombed enemy establishments in the Vardar Valley and east of the Struma.

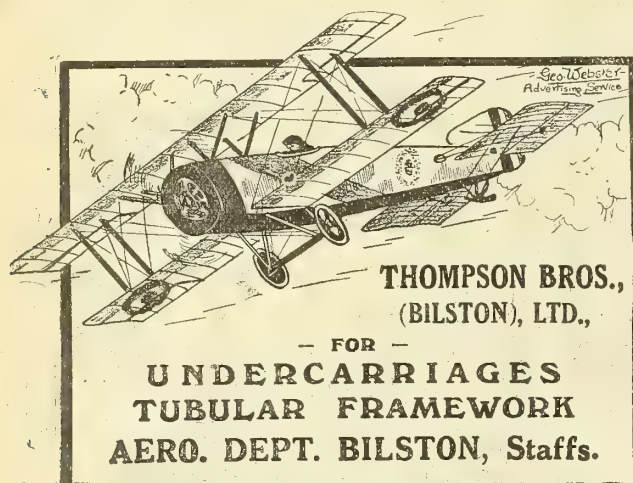
\* \* \*

It is reported that through the fortunes of shipwreck, or rather seaplane wreck, Ensign Richer and Mate Guerin, of a French seaplane, have just had the honour thrust on them of establishing a world's record of 80 consecutive hours of sea navigation in a seaplane.

During the 80 hours afloat, says Mr. Henry Wood, the United Press of America correspondent with the French armies, their immense French seaplane, propelled only by the sea and the wind, covered over 90 miles of voyage.

The feat gives some idea of the development that has taken place in the hydro-aviation service of the French navy, which is kept fully as secret as the development that has taken place in the navy itself since the beginning of the war.

On Jan. 12th Ensign Richer, who commanded a seaplane squadron on the Algerian coast, started out with two machines on a submarine hunt. When 20 miles from land the machine in charge



**THOMPSON BROS.,**  
(BILSTON), LTD.,

— FOR —

**UNDERCARRIAGES  
TUBULAR FRAMEWORK  
AERO. DEPT. BILSTON, Staffs.**

## Aeroplane Steel Sheets

as supplied by us to

**The Royal Aircraft Factory  
and leading Aeroplane Makers**

Guaranteed to comply with the R.A.F. No. 9A specification. Stocked in all gauges. (Sheets are passed and stamped by the "A.I.D.")

**BERNARD NICKLIN & CO.**  
IRON AND STEEL WAREHOUSE  
SMETHWICK, BIRMINGHAM

Telegraphic Address:  
"Bernico," Birmingham.

Telephone No.:  
324 Smethwick.



**FREMO  
TAPER  
PINS**

Does the taper pin enter into your products? If so, your reputation may easily rest upon a taper pin. We supply only taper pins which build and maintain reputations.

**Fredk.  
Mountford  
Ltd.**

**Fremo Works,  
Lifford,  
BIRMINGHAM**

## DYKE'S AUTO-ENCYCLOPEDIA.

SIXTH EDITION, 1918.

### THE STANDARD WORK ON MOTOR MECHANISM

A nation has been given for this book to be supplied through H.M. Stationery Office to Schools of Military Aeronautics. Adopted by the American Government (War Dept.) for use in all their Aviation Schools.

**A Thorough, Practical & Simple Treatise on Principle, Construction, Repairs and Troubles—and How to Remedy Them.**  
**THE BOOK for the EXPERT and the STUDENT.**

Containing upwards of 900 pages. 775 Illustrations on Electrical Subjects, 1,189 Illustrations on Repairs and Adjustments. 300 Illustrations on "The Ford." 5 Coloured Inserts.

OVER 250,000 COPIES SOLD.

Price **£1:1:0** net, post free, cash with order, from your Bookseller, or direct from the Publisher,  
**S. G. GILLAM, Dome Building, RICHMOND, SURREY.**

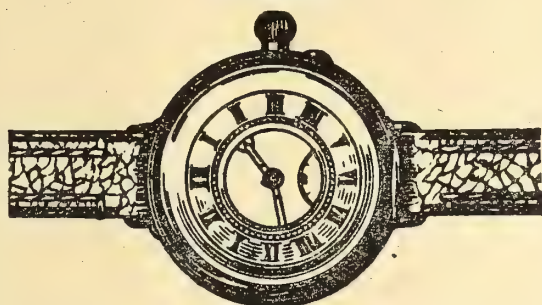
Prospectus on Application.



JEWELLERS



SILVERSMITHS



Patent No. 11974/15

### THE "MILITARY" LUMINOUS WATCH.

A THOROUGHLY reliable and practical luminous watch, indispensable for Naval or Military Service. The "Military" Luminous Watch is the only Screw Case Silver Watch fitted with a "hunter" cover, and is the exclusive patent of The Goldsmiths and Silversmiths Company, Ltd.

As illustrated.

£4 12 6

Without Cover.

£3 15 0

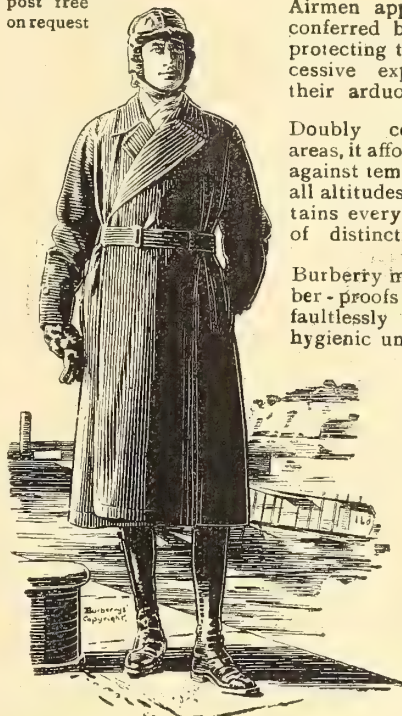
THE  
**GOLDSMITHS & SILVERSMITHS  
COMPANY, LTD.** with which is incorporated The Goldsmiths  
Alliance Ltd. Established 1734

Only one Address (no branches):

112, REGENT STREET, LONDON, W.

## THE TIELOCKEN Burberry Weatherproof

1282  
Military  
Catalogue  
post free  
on request



Airmen appreciate the benefits conferred by The Tielocken in protecting them during the excessive exposure entailed by their arduous duties.

Doubly covering vulnerable areas, it affords an efficient shield against tempest, rain or cold, at all altitudes, in a form that maintains every Burberry tradition of distinction and usefulness.

Burberry materials, unlike rubber-proofs or oiled-silk, are faultlessly self-ventilating and hygienic under all temperatures.

**Complete Kits in  
2 to 4 Days or  
Ready to put on**



Every Burberry Garment bears this Label.

During the War, Officers' Burberry Weatherproofs Cleaned and Re-proofed FREE OF CHARGE

**BURBERRYS Haymarket LONDON S.W. 1**  
8 & 10 Boul. Malesherbes PARIS: also Provincial Agents

*Of special  
interest to Government  
Contractors.*

## J.B. BROOKS & CO. LTD.

Contractors to the Admiralty, War Office,  
Air Board, Ministry of Munitions, etc.

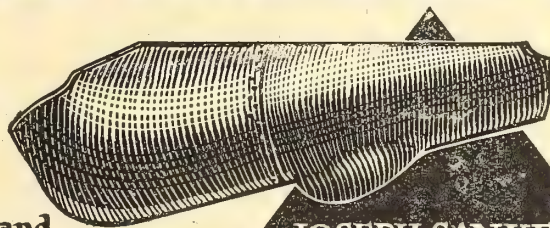
And the Leather Specialists with  
the Largest Works, Finest  
Equipment, Best Facilities, and  
widest experience in the Trade,  
invite enquiries for Articles,  
Parts, Fitments, and Cases of

# LEATHER

*J.B. Brooks & Co. Ltd.  
104 Criterion Works  
Birmingham.*

1131

# UNDER SHIELDS



and  
other light  
Pressed and  
Stamped Work  
in Steel and  
Aluminium

**JOSEPH SANKEY  
& SONS, LTD.**

Hadley Castle Works  
Wellington  
Shropshire

FOR  
**AEROPLANES**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



of himself and Second Mate Guerin was forced to take to water owing to an accident to the motor.

The second seaplane was in the act of alighting in the sea by their side in order to render any assistance possible, when Ensign Richer signalled it not to take to the sea but to go in search of a tug. The second seaplane accordingly headed towards the Algerian coast, and this was the last seen of it.

Richer's machine had been forced to alight in the sea on the afternoon of Jan. 12th. Night came on without their seeing any passing ship. During the night, however, cannon shot were heard, and they at once sent up rockets, but still without success. In the meantime the sea became rough, and their seaplane would have been wrecked had it been made like any other than the new strongly built ones that the French Marine has developed.

During the morning of the 13th the cable of the floating anchor broke, and destruction again threatened. The crew of two men, however, rigged up a second anchor of what heavy material there happened to be aboard the machine, and also repaired both the floats and the wings of the machine, which had been badly damaged during the night's storm.

During the 13th land was sighted, but the seaplane was driven out to sea again. Provisions and water were almost exhausted on the 14th, but it was not until the night of the 15th-16th that a patrol boat, which had been searching since the afternoon of the 12th picked up the two men, who were little the worse for their experience.

#### GERMANY.

##### OFFICIAL COMMUNIQUÉS.

—FEB. 19th.—Seven enemy aeroplanes were brought down yesterday in aerial fighting. First Lt. Lörzer obtained his 21st victory in the air, and Lt. Udet and Lt. Kroll obtained their 20th victories.

FEB. 22nd.—During the last three days 24 enemy aeroplanes and two captive balloons have been brought down in aerial fighting and by gunfire.

\* \* \*

A message from Amsterdam, dated Feb. 18th, states that the Wolff Agency publishes a semi-official report in regard to the recent bombing of Dover announced by the British Home Command.

The agency states that in German official circles no confirmation is forthcoming of this attack on the English coast, and adds that in to-day's German newspapers an account of the raid is headed: "Who bombed Dover?"

#### ITALY.

##### OFFICIAL COMMUNIQUÉS.

FEB. 19th.—In the course of an air combat one of our aviators shot down an enemy machine near Pederobba (Piave).

During the early hours of last night, hostile aeroplanes dropped bombs on various inhabited localities in the Plains; at Vicenza, where four bombs exploded, we have to lament a few victims. The damages are slight.

FEB. 20th.—During the day the aerial activity was noticeable on both sides along the front lines. At dawn a squadron of British machines surprised the aviation ground of Casarsa, and dropped bombs on it, with very good effects. An airship shed was destroyed.

Early in the night one of our flights reached the aviation camp of La Comina, and dropped there two tons of explosives, causing a large fire. All of our and of the Allies' machines returned without any damage.

On the evening of the 19th one of the enemy aeroplanes, returning from bombarding inhabited places, was brought down near Villorba (north of Treviso).

FEB. 21st.—A hostile aeroplane was brought down in Val di Campomulo (Plateau of Asiago).

Italian and British bombing flights have attacked and efficaciously struck the enemy's aviation camps near La Comina, Aviano (both north of Pordenone), Vispadello, and Motta di Livenza. Over the last one the Navy seaplane dropped two tons of high explosive bombs. All the machines returned without any damage.

Between 7 o'clock last night and 1 o'clock in the morning enemy aeroplanes flew over our cities, causing considerable damage to their artistic patrimony. Padua was bombarded three times; numerous bombs were dropped over Vicenza, Mestre, Venice, and Trebaseleghe (north-west of Mestre). Fortunately, we have to deplore but few victims among the civilians, mostly women. The anti-aircraft batteries met the enemy with an intense fire; one machine was struck, and came down aflame near Volpago (south of the Montello).

Yesterday morning one of our flights bombarded efficaciously the railway station of Innsbruck (35 miles from the nearest point of the Italian front).

FEB. 22nd.—During the morning English aerial squadrons bombarded the enemy aviation grounds both north and south of the Oderzo-Portogruaro (Mid Venetian Plain) railway line.

During the course of the day three enemy aeroplanes, brought down in the course of aerial engagements, fell respectively near Gallio (north-east of Asiago), to the north of Asiago, and at

**The Air Navigation Co., Ltd.**

## BLERIOT & SPAD AIRCRAFT WORKS, ADDLESTONE (SURREY).

**Contractors to War Office and  
Admiralty.**

**Flying Ground — Brooklands Aerodrome.**

**NORBERT CHEREAU, Managing Director.**

Telegrams—Bleriot. Weybridge.

Telephone—353 Weybridge.

**"CROID"**  
LIQUID GLUE  
'Approved' by 'A.I.D.'  
Sole Manufacturers:  
The Improved Liquid  
Glues Co., Ltd.,  
Gt. Hermitage Street  
London, E.  
Contractors to H.M.  
Government.

## SALMSON AERO-ENGINES

(Canton-Unné System).

All enquiries should be addressed to  
**THE DUDBRIDGE IRON WORKS, L<sup>d</sup>.**  
**STROUD,**  
**GLOUCESTERSHIRE.**

London Office:

87, Victoria Street, S.W.1.

'Phone: CAMBS. 5.

THE

Wires: "CARBON," CAMBS.

## Cambridge School of Flying

**30b, St Andrew's St., Cambridge,**

beg to announce to **Manufacturers,**  
Engineers, Inventors, etc., that in addition to their

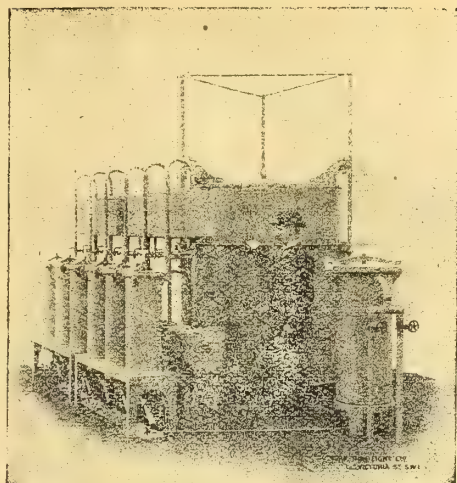
## FLYING COURSE (Prospectus on Application) and CORRESPONDENCE COURSE

(Thorough and Up-to-date tuition) they are prepared  
to undertake **Tracing, Preparation of Working Drawings,**  
**Detail Design, Patent Specification Drgs., etc.**

**QUICK DELIVERY—CAREFUL WORK—MODERATE CHARGES**

Enquiries to "Design Dept."





Class 5 Imperial Acetylene Welding Plant.

## OXY-ACETYLENE PLANTS

**IMPERIAL LIGHT LTD.,**

123, Victoria Street,

LONDON,

S.W.1.

Telegrams—

"EDIBRAC,  
PHONE,  
LONDON."

Telephone—

VICTORIA

3540

(3 Lines)

THE USE OF

## NAYLOR'S Aero Varnishes

**WILL ENSURE A  
PERFECT FINISH**

Many years' experience combined with up-to-date methods and scientific selection of materials ensure the production of varnishes unexcelled for durability and reliability.

**Some Specialities  
for Aero Work**

Woodfillers, Stains, Aircrew Varnish, Spar Varnish, Float Varnish, White Copal Finish for Dope, Enamels, Engine Paints, Etc., Etc.

Free Samples for trial  
on application.



**NAYLOR BROTHERS (London) Ltd.**  
Contractors to all Government Departments.

Offices: 407/9, OXFORD ST., LONDON, W. Works: SOUTHALL MIDD.

## MOSS— AERO-ENGINE GEARING

Manufactured  
on principles ensuring  
greatest

**STRENGTH  
AND  
ACCURACY.**



**GEARING FLYWHEELS CAMSHAFTS**  
R.A.F. PROPELLER BOSSES

Our Aero parts are made in specially **HIGH TENSILE**  
STEEL, heat treated and all parts corrected for distortion

**TRANSPORT, LORRY & PLEASURE CAR GEARING**

Bevel and Worm Drives accurately generated. Steering Worms and Sectors.  
Spur and Bevel Differentials. Gear Box Gears. Camshafts with guaranteed  
Glass-hard Cam Profiles.

## —GEARING

**THE MOSS GEAR CO., LTD.**

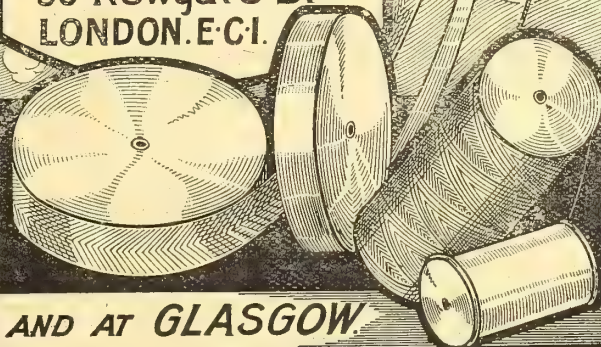
W. DUCKITT Managing Director Thomas St., Aston, BIRMINGHAM

## TAPES WEBS CORDS AND THREADS

for **AIRCRAFT**

**ELECTRICAL & MUNITION WORK.**

**JOHN MAC LENNAN & Co**  
30 Newgate St  
LONDON. E.C.1.



**AND AT GLASGOW.**



Motta di Livenza. The last mentioned was brought down by British aviators.

FEB. 23rd.—An enemy aeroplane was shot down by one of our aviators in the vicinity of Cison; two others, struck by British aviators, fell down east of Salgarado.

FEB. 25th.—During the day intense aerial activity over the first lines. Four of the enemy's machines, two brought down by the French aviators and two by ours, fell in the region of Mt. Grappa; a fifth, struck by our anti-aircraft batteries, came down aflame near Borso (north-east of Bassano).

In the night our flights hit the railway stations of Mattarello (south of Trent) and of Primolano (Val Sugana) while there was an intense traffic, and bombarded the enemy aviation camps near La Comina (north of Pordenone) and S. Fior di Sopra (north-east of Conegliano).

Once again hostile machines dropped bombs on inhabited places at Castelfranco, Mestre, and Venice.

\* \* \*

It is reported that Signor Gabriele d'Annunzio, the poet-novelist-aviator and cavalry major, has been decorated with the British Military Cross by the G.O.C. R.F.C. in Italy.

A message from Rome states that a British aeroplane arrived at an aerodrome near Rome on Feb. 21st, the pilot being Flt. Comdr. Leslie, with Air Mech. Hatch. The machine left London at 9.12 p.m., stopping on the way at Paris, Lyons, Marseilles, Nice, and Pisa.

#### TURKEY.

##### OFFICIAL COMMUNIQUÉS.

FEB. 23rd.—In the vicinity of Keshan an enemy aeroplane was shot down. The occupants were taken prisoners, and they were prevented from destroying their aeroplane.

FEB. 25th.—In an aerial encounter we shot down one enemy aeroplane.

#### BELGIUM.

##### OFFICIAL COMMUNIQUÉ

FEB. 24th.—Our aviators carried out a number of flights, and engaged in several combats.

#### PORTUGAL.

##### OFFICIAL COMMUNIQUÉ.

FEB. 20th.—A Gotha aeroplane was brought down in our area. We captured two officers and two serjeants forming the crew.

#### HOLLAND.

An aeroplane is said to have dropped bombs on a meadow near Sluis, Zeeland, on Feb. 17th.



By Royal Warrant of Appointment.

## ARNOLD & SONS

Established 1819.

**ENGINEERS AND  
INSTRUMENT .. ..  
MANUFACTURERS.**

*Sheet Metal Work, Sheet Metal Pressing,  
Stamping, Spinning, Acetylene Welding,  
Nickel Plating, Silver Plating, Electro  
Tinning, etc., etc.*

**STANDARD WORKS,  
LAWRENCE ROAD,  
TOTTENHAM, N.15.**

Head Office : GILTSPUR STREET, E.C.1.

TELEGRAPHIC ADDRESS:—

"INSTRUMENTS,"

LONDON.

TELEPHONE Nos. :—

City Office : 5240 City.

" " 5241 "

" " 5242 "

Factory : 2370 Tottenham.

" 2371 "

# UNDERCARRIAGES

**A. V. ROE, TYPE 504.**

**FOR IMMEDIATE DELIVERY.**

ENQUIRIES INVITED FOR WOODWORK AND METAL SPARES.



**JOSEPH G. NAVARRO,**  
**AERONAUTICAL ENGINEER,**  
**BRANSTON ROAD,**  
**BURTON-ON-TRENT**

## The Book of the Hour.

# "AIRCRAFT IN WAR AND COMMERCE."

By W. H. Berry.

**1/6**

NET.

Introduction by

**LORD MONTAGU.**

Brilliantly Illustrated.

By Geoffrey Watson.

**1/6**

NET

Of HORACE MARSHALL & SON, Temple House,  
and 125, Fleet Street, London, E.C.; or

ED. J. BURROW & CO., LTD., Regent House  
(Kingsway Bureau); and all Booksellers.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# Blackburn

*"Always at the Front."*

## AIRCRAFT

The BLACKBURN  
AEROPLANE and  
MOTOR CO. Ltd.  
LEEDS  
and HULL

### OFFICIAL ACCEPTANCE TESTS

#### LAND MACHINES.

S.P.A.D.	Auro
Sopwith	Armstrong-
B.E.	Whitworth
Short	D. H. A.
Curtiss	Handley-Page
Mann, Kearton	Bristol
M. Farman	Vickers
H. Farman	Nieuport
Morane	Supermarine, &c.

#### SEAPLANES.

Short, Sopwith, America Boats, F.B.A.  
Boats, Curtiss Boats, Norman-Thompson,  
A. D. Boats, &c.

*Private Aerodromes  
Surveyed and Pilots'  
Reports Furnished.*

#### DELIVERY AND EXPERIMENTAL FLIGHTS ON LAND MACHINES & SEAPLANES.

COMPLETE REPORTS FURNISHED.

Rates on application to

THE

**PRODGER - ISAAC**

AVIATION COMPANY

(C. B. Prodger and Bernard Isaac),

166, Piccadilly, London, W.1.

Telephone: Gerrard 278 (2 lines)

Telegrams: "Aeromnia, Piccy, London."

#### CLIFFORD B. PRODGER

J. LANKESTER-PARKER,  
and other Pilots.

Approved Admiralty Pilots  
— for Acceptance Trials. —

#### INSURANCE.

WE are now in a position to quote low rates, through our brokers at Lloyd's, for the Insurance of Aircraft during ACCEPTANCE TRIALS AND DELIVERY FLIGHTS with an excellent and most comprehensive Policy. May we quote you for your new contracts?

SPECIAL ARRANGEMENTS with Sub-Contractors for HANDLEY-PAGE Type Land Machines or "AMERICA" Type Flying Boats

## HIGH-CLASS ALUMINIUM CASTINGS

FOR ALL TRADES.

We Specialise in Aluminium Cylinders and  
General Aero and Motor Engine Castings,

## CAST IRON CYLINDERS

Water and Air-cooled for Aero & Motor Engines

ALL THE ABOVE CASTINGS  
TO GOVERNMENT SPECIFICATION.

**WILLIAM MILLS, LTD.,**

Atlas Works :: Grove Street,

**BIRMINGHAM.**

ALUMINIUM AND IRON FOUNDERS.



**Bowden  
Wire Ltd.**  
London

BEING wholly engaged upon production for the British and Allied Governments, we regret that we are unable for the present to execute any orders for private purposes.

Victoria Road, Willesden Junction, N.W. 10.  
Established 1897.



THE  
**"BOWSER" AEROPLANE SEATS**

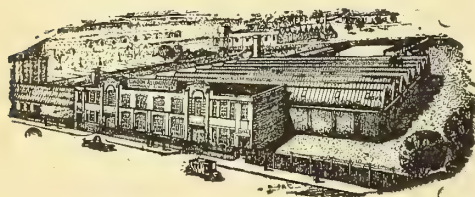
(Made to A.G.S. Drawing 264).

Supplied to the Royal Aircraft Factory and the Leading Aircraft Manufacturers.

Manufactured by **EDWARD BOWSER, 50, Park Lane, Leeds.** Tel. No.: Central 3473.

Under the A.I.D. Inspection.

Northern Representative—  
 Mr. **WALTER M. DANIELL**,  
 33, East Beach, Lytham.



## PRESS-WORK & SPINNINGS

and Sheet Metal (War) Work generally.

The **LONDON ALUMINIUM Co., Ltd.**, Aircraft Dept.,  
 Westwood Road, Aston, B'ham. 'Phone: East 497.

**EBORA**  
 PROPELLER  
 Company  
 11 & 12 Surlingham Park  
 Terrace KINGSTON  
 on Thames  
 Telephone  
 KINGSTON 672  
 Telegrams  
 EBORA, KINGSTON

# Elvora Propellers

Contractors  
 to the Admiralty  
 and War Office  
**SCHOOL PROPELLERS**  
**FOUR BLADES**  
**SEAPLANE PROPELLERS**  
**SLATE TABLES For**  
**PROPELLER WORKS**

## RUBBER P.R. TUBINGS APPROVED A.I.D.,

'Phone:—CITY 3811 and 3812.

WASHERS, RINGS, BUFFERS, SHEET, STRIP, MATTING, MOULDINGS.

**JAMES LYNE HANCOCK, Ltd., 266 Goswell Rd., London, E.C.1**

# Lang Propeller LTD.

Contractors to  
 the Admiralty  
 and War Office.  
**WEYBRIDGE,**  
**SURREY.**

## HIDE GLUES FOR AIRSCREWS AND AIRCRAFT CONSTRUCTION.

— APPROVED BY H.M. ADMIRALTY AND A.I.D. —

Manufacturers—**Wm. OLDROYD & SONS, Ltd., 9, Mincing Lane, London, E.C.3.**

Telephone: 4978 Avenue.

## STANLEY PROPELLERS

By the **STANLEY AVIATION CO.,**

TELEPHONE  
 DALSTON 45.

**CHATHAM PLACE, MORNING LANE,**  
**HACKNEY, LONDON.**

**GOVERNMENT**  
**CONTRACTORS.**

Telephone—East 3833.

## THE STANDARD Aircraft Manufacturing Co., Ltd.

**28, BOW COMMON LANE, LONDON. E.3.**



**ZOTA**

**CASHMORE BROS. ENGINEERS**  
ZOTA WORKS, HILDRETH ST., BALHAM, S.W.12  
Telephone—BATTERSEA 415

**BOLTS, NUTS, SCREWS, etc.** for **AIRCRAFT**  
in Brass & Steel

REPETITION WORK FOR ELECTRICAL, MEDICAL, AND OPTICAL INSTRUMENTS, AND FOR THE MOTOR TRADE

**WORKS**

## HEATING, DRYING AND VENTILATION.

**Kinnell's**

OF DOPE SHOPS, AERODROMES, AND  
AIRCRAFT FACTORIES, &c., OF EVERY  
DESCRIPTION. List 1134 free.

**C. P. KINNELL & CO., LTD.** Phone—Hop 372  
65, SOUTHWARK ST., LONDON, S.E.1.

## THE POOLE AVIATION CO. POOLE, DORSET.

*Contractors to H.M. Government.*

**Spares and all Parts of Machines.**

**ENQUIRIES INVITED.**

'Phone: Poole 54.

'Grams: Aviation, Poole.

WE HAVE INVENTED

# THE

NON-EVAPORATING

# DOPE POT

ARTHUR HILL & Co.,  
SHEET METAL WORKS,  
SILCHESTER ROAD,  
LONDON, W.10.

Phone—1443 PARK.

**Berling Magneto**  
insures a hot, fat  
spark at any  
altitude

Worth more  
Does more



Manufactured  
by the  
**Ericsson Mfg. Co.**  
Buffalo N.Y. U.S.A.

Manufacturers  
.. of .. **PHOSPHOR BRONZE,**

**GUN METAL,**

MANGANESE BRONZE,

**BRASS & COPPER**

TUBES, SHEETS,  
RODS, WIRE, AND

**CASTINGS.**

PHOSPHOR TIN,  
PHOSPHOR COPPER.



**CHARLES CLIFFORD & SON, LTD.,**  
BIRMINGHAM.

## Aluminium Castings

Sand or Die  
of every  
Description

2 H.P. to 600 H.P.

BEST METAL

GOOD CASTINGS

QUICK DELIVERIES

Contract to  
H.M. Government  
**Chill Castings for  
Aeroplanes a Speciality**

Telephones: 3846 City. Telegrams: 4879 Central. **Ernest & Co.**  
4879 Central. **Ernest & Co.**

**R W COAN**  
The Aluminium Foundry  
219, COSWELL ROAD,  
LONDON, E.C.



## CLABOUR-WESTBAY

FOR

## 2.B.A. Bolts—A.G.S. 103

Entire Output at present absorbed  
—by Government Requirements.—

**W. A. Clabour, Westbay & Co.,**  
KIRKSTALL, LEEDS, Ltd.

Phone; Headingley 709.

Telegrams: Clabour, Kirkstall.



## TRADE CARDS.

## AEROPLANE TIMBER SPECIALISTS

**JOSEPH OWEN & SONS, Ltd.,**  
**Borough Saw Mills, LONDON, S.E.**

Telephone: HOP 8811 Telegrams: "BUCHERON, SEDIST."

## Advertising

For GOOD ADVERTISING consult  
 Godbolds, 8, Breems Buildings,  
 London, E.C.4. Estimates Free.  
 Phone: City 5912. E. H. Godbold,  
 Director



## JAMES NORTH HARDY &amp; SON, LTD.,

54, PORTLAND STREET, MANCHESTER,  
 MANUFACTURERS of all descriptions of COTTON and LINEN  
**WEBS, TAPES & TWINES FOR AIRCRAFT**  
**AND ELECTRICAL WORK.**

London Branch: 3, FITCHETT'S COURT, NOBLE STREET, E.C.

Mills: HEATON PARK, nr. MANCHESTER.

Tel. Add.: "Hardson," Manchester. Phone: No. 6471 Central.

## FREDK. WARD

— FOR —

## Aero Engine and Gun Gear Parts

ALSO PATTERN AND JIGS.

ALLSOP ST., UPPER BAKER ST., N.W.

Phone: Paddington 4743.

## NAME PLATES.

WE SPECIALISE IN EVERY DESCRIPTION OF  
 NAME PLATES IN METAL, IVORINE, ETC.

**CLEGG METAL ENGRAVING CO.,**  
 CHATSWORTH WORKS, WORTHING.

## ALWIN ENGINEERING CO., AERONAUTICAL ENGINEERS,

LUTHER ROAD, TEDDINGTON, S.W.

Tel. No. Kingston 2412.

Makers of all kinds of Aircraft Fittings. Presswork  
 a Speciality. :: Pressings for DeH, etc.  
 AVRO, SOPWITH, FAIREY and many other types.

On receipt of Post Card our Representative  
 will call and give immediate quotation.



## Springs! Springs! Springs!

We make a speciality of  
 Springs for Aeroplanes.  
 SEND FOR PRICES.

**Dart Spring Co., West Bromwich.**

## SAVE TIME.

## H. DUNSHEATH &amp; CO.,

Makers of Every Description of  
 STEEL MARKS, DIES, LETTERS, FIGURES, BRASS  
 STAMPS AND IRON BRANDS.

Seals, Brass, Tin and Zinc Labels, Time Checks, Stencil  
 Plates, Brass Name Plates, Rubber Stamps, &c.

**30, ARUNDEL STREET, SHEFFIELD.**

Clean Coloured Rags  
FOR CLEANING & WIPING.

Best and Cheapest for Munition Works ::  
 Engineers, Printers & Bus Companies, etc.

**A. JOSEPH, EARL STREET, LONDON ROAD,**  
**LONDON, S.E. 1.**

Telephones: Hop 83, 361 & 4272.

"Cheaper than cotton waste."

## P.D.V. Aircraft Company, Ltd.

All Metal Parts for Aircraft made, comprising the  
 following machine work: Milling, Turning,  
 Shaping, Press Work, Slotting, Drilling, Grinding and  
 Sheet Metal Work. Well-equipped Welding and Brazing Plant.

Enquiries to - **P.D.V. AIRCRAFT COMPANY, Ltd.,**  
 Offices & Works: **Princes Street, Richmond, Surrey.**

Telegrams: Asres, Richmond.

Telephone: 1681 Richmond.

## Chauvière's famous Integral Propellers

HOLD ALL RECORDS; USED BY ALL  
 LEADING AVIATORS. THE BEST

Sole Proprietors for Great Britain and Colonies

**THE INTEGRAL PROPELLER CO., LTD.,**

Edgware Road, The Hyde, Hendon, N.W. 9.

Telephone—Kingsbury 104. Telegrams—"Aviprop, Hyde, London."

## EBORA PROPELLER COMPANY LTD

**Ebora**

## PROPELLERS

Contractors to the ADMIRALTY & WAR OFFICE

11 & 12 SURBITON PARK TERRACE, KINGSTON-ON-THAMES

Telephone: KINGSTON 672

Telegrams: "EBORA, KINGSTON"

SCREW-DRIVING  
RUSSELL BROTHERS, Ltd., REDDITCH  
MACHINES.

Trade **MENDINE** Mark.

## LIQUID SCOTCH GLUE

USED BY THE LEADING AEROPLANE CONSTRUCTORS.  
 MOISTURE PROOF

Write for Price List and Particulars

**MENDINE CO., 8, Arthur Street, London Bridge, E.C.**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# PLYWOOD

In all Thicknesses and Qualities.

**SIBERIAN & GENERAL TRADING CO., Ltd.,**

**1-3, Leonard Street, City Road, LONDON, E.C.2.**

Telegraphic Address: "Wolosey, Finsquare, London." Telephone: London Wall 3577.

## MISCELLANEOUS ADVERTISEMENTS.

### AVIATION

#### AVIATION INSTRUCTION

on up-to-date lines, by a qualified Engineer in Aeronautics. Demonstrations from complete set of parts, and sectioned models.

Send for Prospectus No.1.A.,

**THE MOTOR TRAINING INSTITUTE LTD.,**

10, Heddon Street, Regent Street, W.1.

### ENGINEERING.

**British School of Aeronautics.**—Aircraft Engineering Course; Aero Design; Aero Construction; Aero Draughtsmanship; Mechanical Engineering.—Pennington's, 254, Oxford Road, Manchester.

### AIRCRAFT PARTS.

**Hardwood for Aeroplanes.**—Specially Selected air-dried timber as supplied to leading constructors in Britain and the Continent. Silver Spruce, Ash, Poplar; Hickory and Ash Skids; Three-ply; Thin Cedar and Mahogany for Floats; Walnut for Propellers.—William Mallinson and Sons, Ltd., Hackney Road, 'Phone, 3845 Central, 4770 Wall.

**Tapes, Webs, Cords and Threads** in all qualities, suitable for Aircraft Work. Delivery from stock.—John MacLennan and Co., 30, Newgate Street, London, E.C.1. (See Advertisement Page 857 and Buyers' Guide).

**Aeroplane Seats** to any drawing or specification. Prompt deliveries.—F. C. Chappell, Cane Works, 9, Fisher Street, Nottingham.

**Aeroplane Seats.** We can give quick delivery of cane seats, A.G.S. 264 or other patterns, guaranteed pass inspection. Write us for anything required in cane work.—The Willowbrook Company, Leicester.

**Aeroplane Petrol Cocks,** over 30 types made—tees, elbows, fourways, etc., delivery from stock. Petrol components.—Apply, H. Burton and Co., Ltd., Cannon Works, Willesden, N.W.10.

**Bolts and Eye Bolts.**—We can make quick delivery of bolts and eye bolts of every size, and send quotation on demand.—R. L. Dubois and Co., Aeronautical Engineers and Manufacturers, 673, Romford Road, Manor Park, E.12.

**Aircraft.**—Aeroplane propeller works. Genuine going concern, fully equipped with the latest wood-working machinery, tools, fixtures, fittings, and stock of timber. Occupied on Government contracts. Labour and complete organisation can be taken over, large monthly output. Excellent prospects, open to inspection. Principals only need apply. London area.—Box 333, C. Smith's, 21, Bush Lane, E.C.4.

### WANTED.

**Wanted Woodwork** for aeroplanes, very large up-to-date factory, fully equipped with latest machines; any class of aircraft work undertaken; prompt deliveries; best work.—Apply Box 3030, THE AEROPLANE, 166, Piccadilly, W.1.

**Deperdussin.**—Wanted Photos of 25, 28, and 35 H.P. Deps. of 1912.—Box No. 3343, THE AEROPLANE, 166, Piccadilly, W.1.

**Wire and Cut Nails and Box Hooping,** or  $\frac{1}{2}$ -in. and  $\frac{3}{4}$ -in. thin strip iron. Large quantities wanted ex. stock, for cash.—"C." Box 125, Benson's, Kingsway Hall, W.C.2.

**Engineering Firm** with well-equipped machine shops, now engaged on munitions, solicits inquiries for all classes of turning, drilling, grinding, milling, fitting, etc. Aircraft fittings, also copper pipe work, a speciality. Correspondence with a view to post-war business especially invited.—The Lankester Engineering Co., 39, Eden Street, Kingston-on-Thames.

**Piercing and Blanking Dies** for aeroplane sheet metal parts. Quick deliveries, reasonable charges. Light punching work also undertaken.—The Remus Co., Ltd., Letchworth.

**Wanted immediately,** pressure and gravity tanks for D.H. machines.—Box No. 3378, THE AEROPLANE, 166, Piccadilly, W.1.

**Wanted,** sub-contracts for aircraft wood parts or other munition wood work.—Box No. 3379, THE AEROPLANE, 166, Piccadilly, W.1.

**A quantity of 1/16 in. three-ply birch cuttings** required. Sizes must not be less than 4 ins. by 1 ft.—Ruffy Aeroplane Co., Noel Road, Acton, W.3.

### FOR SALE.

**To Aeroplane Manufacturers** and others, Rochester. To be sold with immediate possession, valuable freehold premises, with ample buildings, including mill fitted 12 h.p. gas engine and all necessary woodworking machinery.—Full particulars of Messrs. Prall and Prall, Surveyors, Rochester, Kent.

**Typewriter,** "Hammond," equal to new, for sale.—Apply, Box No. 3377, THE AEROPLANE, 166, Piccadilly, W.1.

**Aircraft.**—To aeroplane manufacturers. Premises at Hendon, suitable for making aeroplane parts, with land for extension. Available floor space, 10,000 sq. ft. For sale freehold.—Apply, Architect, Keith House, 133, Regent Street, London, W.1.

**"Aeroplane,"** unbound, May 14th, 1914, to April 18th, 1917, except three numbers.—26, Ryecroft Road, Stretford, Lancs.

### TO LET.

**R.F.C. Officer's Wife** wishes to let her well-furnished house—3 or 4 bedrooms, 2 reception rooms. Five min. 'buses and easy walking distance, Hendon Aerodrome. Rent, 2½ guineas weekly.—Apply, Mrs. G. E. Morris, "Dromana," 64, Sunningfields Road, Hendon, N.W.4.

**For disposal, with possession, modern ground floor factory, lofty and well-lighted.** Floor space, 20,000 square feet. Fitted motive power. Electrically lighted. Steam heated, large yard, two van entrances. Situate near London.—For particulars, terms, and orders to view, apply to Fuller, Horsey, and Co., 133, High Holborn, W.C.1.

### PUBLICATIONS.

**Hotchkiss Machine Gun.**—Text book and instructional course. A work giving explicit detail of all Hotchkiss mechanism and gun team drill.—J. E. Singleton, Penn Fields, Wolverhampton. 2s. 6d., post free.

**Glossary of aeronautical words and phrases,** with diagrams and illustrations, English-French terms, metric equivalents. Invaluable to those interested in aircraft. Price, 1s. net, from Aircraft, 69, Bishopsgate, E.C.2.

### MISCELLANEOUS.

**Nerve Failure** speedily cured, self-consciousness eliminated, concentration increased, and confidence restored by sympathetic hypnotic suggestion. Interesting explanatory booklet post free.—Robert McAllan, Regent House, Regent Street, W.1.

**Luminous paint** for wrist watches, clocks, match boxes, etc.; remains luminous for years. Bottles 1/6 and 2/9.—Tobin & Co., 39, Charles Street, Hatton Garden, E.C.

### MODELS.

**Model Aeroplane,** flies  $\frac{1}{4}$  mile circular flight, carriage paid, 3s. 4d. "I can thoroughly recommend your machines." Testimonial from Dr. Adams, Union Road, Sheffield. Thousands satisfied, testimonials from all parts.—Dept. C., Bristol Model Aeroplane Depot, Eastville, Bristol.

**T. W. K. Clarke and Co., Ltd.,** Model Department, Hampton Wick.—Though we are full up with full-size aeroplane parts orders, we still build models as we did in 1906. Sopwith Biplanes, etc., in stock.—Send 3 stamps for our illustrated List, 120 items and 14 models; certain metal goods are out of stock.



## MISCELLANEOUS ADVERTISEMENTS.

**SPECIAL PREPAID RATE:** 18 words 1/6; Situations Wanted ONLY, 18 words 1/-; 1d. per word after. **TRADE ADVERTISEMENTS,** in these columns, 3 lines 3/-; 10d. per line after. Public Announcements, Legal Notices, Auctions, Contracts, etc., 16 per line. For the convenience of Advertisers, replies can be received at the offices of "THE AEROPLANE" 166, Piccadilly, 1 croon, W.1.

## PATENTS.

**PAGE & ROWLINSON,** Chartered Patent Agents (Consulting Engineer, Mr. S. E. Page, A.M.Inst.C.E.), 27, Chancery Lane, London, W.C. Tel. 332 Central.

**Henry Skerrett,** Chartered Patent Agent, 24, Temple Row, Birmingham.—Patents, trade marks, and designs.

**Inventors advised free.** Write for booklet.—King's Patent Agency, Ltd., 165, Queen Victoria Street, London, 30 years' references. **Stanley, Popplewell and Co.,** Patent Agents and Consulting Engineers. Applications for Patents attended to in all countries.—38, Chancery Lane, W.C. Telephone: 1763 Central. Circular free.

## SITUATIONS VACANT.

**A Large Firm,** London, N.W., has several vacancies for aeroplane erectors and assemblers, used to accurate and high-class aeroplane work. No one living more than 10 miles away or engaged on Government work need write to Box 3360, THE AEROPLANE, 166, Piccadilly, W.1.

**Wanted Foreman** of erecting shop in flying boats factory. Must be thoroughly experienced and capable of efficiently controlling men and obtaining best results. No one on Government work will be engaged.—Apply, stating fully, experience, age, and wages required, to your nearest Employment Exchange, mentioning this paper and No. A4654.

**Wanted** capable assistant foreman to take charge of turners, machinists and fitters on night shift in aircraft factory. Improving position for the right man. Men on Government work need not apply.—Apply, stating fully, experience, age, and wages required, to your nearest Employment Exchange, mentioning this paper and No. A4655.

**Aeroplane Draughtsmen.**—Wanted by old established aeroplane manufacturers several first-class draughtsmen, with previous experience of aeronautical work preferred.—Apply, with full particulars of qualifications and salary required, to your nearest Employment Exchange, mentioning this paper and No. A4697. Men on Government work need not apply.

**Aviation Engine Manufacturers** in Midlands require immediately several good draughtsmen, essentially with experience in internal combustion design. No one on Government work need apply.—Apply, stating age, qualifications, and salary required, to your nearest Employment Exchange, mentioning this paper and No. A4661.

**Several First-class Mechanical or Aeronautical Draughtsmen,** with workshop experience and technical training, are required immediately by well-known firm in London. Ordinary working hours, 40½. Overtime paid and good war bonus. No one employed on Government work should apply.—Apply, giving full particulars of training, subsequent experience, qualifications, and salary required, to your nearest Employment Exchange, mentioning this paper and No. A4518.

**Cabinet Makers, Pattern Makers, Coach-builders, Carpenters and Joiners,** with experience of aeroplane work, or men desirous of obtaining aeroplane work required in Nottingham district.—Apply by letter to Box No. 3393, THE AEROPLANE, 166, Piccadilly, W.1. No person already engaged on Government work or residing more than 10 miles away need apply.

**Intelligent Lady Clerk-Typist required.** Short-hand and knowledge of aeronautical terms desirable, but not essential.—Apply, stating experience, salary required, and references, Box No. 3394, THE AEROPLANE, 166, Piccadilly, W.1.

**Works Manager** required, with prospect of partnership in large aeroplane propeller works, to take over entire charge and control. Must have a thorough practical knowledge of manufacture and timber, and be fully conversant with cost of production.—Write, stating full particulars, experience, etc., in strict confidence, Box A336, Smith's, 21, Bush Lane, E.C.4.

**Wanted, Quantities Clerk,** experienced in aircraft work and in reading drawings.—Write, stating age, experience, and salary required. No one residing more than 10 miles away or engaged on Government work need apply. Hooper and Co., Aircraft Contractors to the War Office, 77, King's Road, Chelsea, S.W. **Progress Men.**—Two first-class, to assist in buying department of London firm. Must be able to get deliveries in to time. Only energetic and capable men will be considered. No one residing more than 10 miles away or engaged on Government work need apply.—Write, V., Box 44, care of Willing's, 33, Knightsbridge, S.W.1.

## RADIATOR AND SHEET METAL WORK UNION WORKMEN (BEST RATES PAID) WANTED

No one already on Government work  
or resident more than ten miles away,  
will be engaged.

Apply—  
**GALLAY RADIATOR CO., LTD.**  
198, Gt. Portland Street, W.3

**Foreman** wanted for aeroplane factory to take charge of propeller shop, including machines. No person residing more than 10 miles away or already engaged on Government work will be engaged.—Write, Box B958, Lee and Nightingale, Liverpool.

**Aeroplane Construction.**—Applications for the undermentioned positions will be immediately considered by a large engineering establishment now engaged in manufacturing aircraft: (1) Assistant works manager, aircraft department; (2) charge hand for fuselage assembly; (3) charge hand for final erection; (4) charge hand for plane erection; (5) charge hand fitter for copper and steel pipings; (6) charge hand for wood conversion. No applicant already on Government work will be engaged.—Apply, in first instance, to your nearest Employment Exchange, mentioning this paper and No. 3388.

**Draughtsman** required with good workshop and office training. Aeroplane experience not essential. No one already engaged on Government work need apply.—Write, Z. D., 127, care Deacon's, 7, Leadenhall Street, E.C.3.

**Charge Hand** wanted for plane assembling shop. No man already engaged on Government work need apply.—Apply to your nearest Employment Exchange, mentioning this paper and quoting number 3381.

**Aeroplane Construction.**—Six aeroplane erectors are wanted immediately by large controlled engineering establishment now manufacturing aircraft. No person on Government work need apply.—Apply, in first instance, stating experience, etc., to your nearest Employment Exchange, mentioning this paper and No. 3389.

**Good Engineering Draughtsmen** wanted, with some experience of aeronautical work preferred, but not essential. Those on Government work need not apply. Write, stating experience and salary required, to nearest Employment Exchange, mentioning this paper and No. 3390.

**Junior Draughtsman,** first-class, wanted, accustomed to getting out quantities and tracings for buying department of London firm. No one engaged on Government work need apply.—Write, V., Box 77, care of Willing's, 33, Knightsbridge, S.W.1.

**Draughtsmen** and a "stress calculator" or two required in aviation works near London. Aeronautical experience and technical knowledge an advantage.—Write, stating particulars and salary required, to the Fairey Aviation Co., Ltd., Hayes, Middlesex.

## SITUATIONS WANTED.

**Works Manager,** or position of trust, 37, practical engineer, invaluable experience both aeroplanes and seaplanes. Tactful, energetic, methodical organiser, accustomed to latest service methods and capable of economically increasing production.—Box 3284, THE AEROPLANE, 166, Piccadilly, W.1.

**Engineer Draughtsman,** two years designer, two checker aeroplane parts. Fourteen years D.O. and shop experience, small mechanical and jig and tool work. Good mechanical training. Excellent references. First-class checker or charge hand.—Box No. 3380, THE AEROPLANE, 166, Piccadilly, W.1.

**Buying Man** seeks responsible position. Good experience engine and metal side of business. Conversant with markets, progressive, can organise system.—Box No. 3384, THE AEROPLANE, 166, Piccadilly, W.1.

**Charge Hand** wants berth, experience in all types of propellers, and well up in A.I.D. requirements. Good references.—Box No. 3382, THE AEROPLANE, 166, Piccadilly, W.1.

**Foreman** wants berth in propeller factory. Good experience, highest references.—Box No. 3383, THE AEROPLANE, 166, Piccadilly, W.1.

**Engineer, Designer,** 15 years' engineering practice, seven years' aircraft experience, open to engagement. Has designed highly successful aeroplanes and hydro-aeroplanes accepted by the Air Board. Extensive experience in works management and the organisation required for the rapid production of standardised machines.—Box No. 3387, THE AEROPLANE, 166, Piccadilly, W.1.

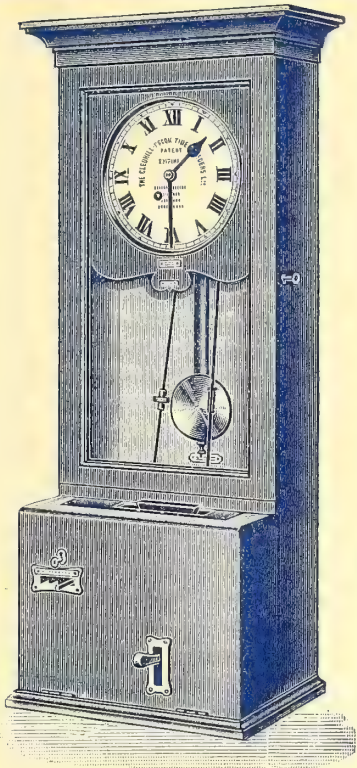
**Engineer,** with London office, wishes to represent a good firm manufacturing articles in connection with the aircraft industries.—Box 3386, THE AEROPLANE, 166, Piccadilly, W.1.

**Foreman,** sheet metal work, also experienced in tube work and coppersmith work. Tactful and good controller.—Apply, Box No. 3392, THE AEROPLANE, 166, Piccadilly, W.1.

**Advertiser** (25), Grade III., public school and two years' university engineering education, desires **APPOINTMENT** under Government Department or on Government work. Some recent experience in Government inspection work.—Box No. 3391, THE AEROPLANE, 166, Piccadilly, W.1.

**Competent Sawmill Foreman,** with 14 years' experience on all woodworking machines, now open for re-engagement. Used to control of large staff. Complete familiarity with machinery aeroplane and propeller work. A good organiser, strict disciplinarian, energetic, keen, and methodical. A man with ideas and initiative, and not afraid of work. Excellent credentials.—Box No. 3395, THE AEROPLANE, 166, Piccadilly, W.1.





The Recorder which stamps  
the definite minute—

IN MANUFACTURE every effort is made to  
produce a reliable strong machine.

Only best materials are used and the Recorders  
are British throughout.

WE ARE SUPPLYING H.M. Government and  
Government Controlled Factories, also many  
Aeroplane Works.

———— CATALOGUE FREE ON APPLICATION. ————

COMBINED TIME AND JOB CARD  
for recording complete labour cost.

The “IN” and “OUT” time is recorded on the  
card, also the time when jobs are changed.

The **TIME on the Job** is cast out at the side of card  
and the total hours entered in the Job No.  
column under the Job number.

**Unfinished Jobs** are entered at the foot with Job  
number and the total hours worked up to the  
week-end under column headed “Carried  
Forward,” and transferred to the next week’s  
time card in the column “Brought Forward,”  
any time worked on this job during the second  
week is entered in the column, “Time for this  
Week.” If the job is completed during the  
second week, the total is added and entered  
in the “Jobs Finished” column. If the  
job is not completed, the total is entered in  
the column “Carried Forward,” which will in  
turn be entered on the third week’s time card.

**STANDING ORDER NUMBERS** for constantly re-  
curring Non-Productive Jobs are represented  
on the card, e.g. K.31 Grinding Tools; E.53  
Making a New Lathe Tool.

CHECK No.		WEEKLY TIME CARD.			
315		Week ending	18 Aug 1916		
		Name	Thos Johnson		
Job No.	IN-ON	OUT-OFF			
1360	5 59 SA				5½
	8 29 SA	12 01 S			
	5 59 M				9½
	8 29 M	1 29 S	5 02 S		
32	5 59 TU				9½
	8 29 TU				
	1 29 S		5 01 S		
	5 59 W				
#75	8 29 W				
	1 29 S				
	3 00 S		3 00 S	32½	7½
1510	6 00 TH		5 01 S		9½
	8 50 TH				
	1 29 S				
	5 00 S			11½	9½
K.31	6 00 M				9½
	7 00 F				
	7 00 F				
	8 29 F				
E.53	10 00 F		10 00 F		2½
	1 30 M				
	4 00 M				
1820			4 00 M		5
1469					
TOTAL FOR WEEK					53
Job No.	Brought Forward	This week	Jobs Finished	Carried Forward	
1360	16	32	48		
1469				1	

THE GLEDHILL-BROOK TIME RECORDERS  
LIMITED.

26, VICTORIA STREET, LONDON, S.W.1.

EMPIRE WORKS, HUDDERSFIELD.

44, HILL STREET, BIRMINGHAM.

Tel. Vict. 1310.

Tel. Midland 2086.

Tel. 1069.



# WYCOMBE AIRCRAFT CONSTRUCTORS, LIMITED.

==  
HIGH WYCOMBE,  
BUCKS.  
==

Telephones : High Wycombe 84 (Stores : High Wycombe 120).  
Telegrams : "Aircraft, High Wycombe."

CONTRACTORS TO THE ADMIRALTY AND AIR MINISTRY.

# SHORT BROTHERS, Aeroplane and Seaplane Works, ROCHESTER, KENT,

— AND —

# Aircraft Works & Flying Grounds, — BEDFORD. —

Telephones :—

627 CHATHAM.  
261 AND 262 BEDFORD.  
788 BATTERSEA.



Telegraphic Addresses :

"SEAPLANES," ROCHESTER.  
"SHORTS," BEDFORD.  
"BALLOONING," LONDON.

London Office : WHITEHALL HOUSE, 29/30, CHARING CROSS, S.W. 1.

Telephone : 378 REGENT.

Telegrams : "TESTED, PHONE, LONDON."

EDITORIAL AND ADVERTISEMENT OFFICES, 166, PICCADILLY, W.1.

Printed for THE AEROPLANE AND GENERAL PUBLISHING CO., LTD., by BONNER & CO., The Chancery Lane Press, Rolls Passage, London; and Published by THE ROLLS HOUSE PUBLISHING COMPANY, LTD., at Rolls House, Breame Buildings, London.



# THE AEROPLANE

WEDNESDAY, MARCH 13, 1918.

Edited by  
C. G. GREGG

Vol. XIV, No. 11

THREEPENCE WEEKLY

[Registered at the G.P.O.]  
as a Newspaper.

## THE NORMAN THOMPSON FLIGHT CO. Ltd.

ESTABLISHED 1909

Telegrams—SOARING, BOGNOR  
ENTIFLYTE CHARLES, LONDON

Works—MIDDLETON, BOGNOR

CONTRACTORS TO THE ADMIRALTY

Telephones—BOGNOR 48. GERRARD 7385

London Office—  
DEWAR HOUSE, 11, HAYMARKET, S.W.1.

DESIGNERS AND MANUFACTURERS OF FLYING BOATS AND LAND PLANES

**Auster** FOR **Aero-shields**  
LONDON. BIRMINGHAM

**BEARDMORE** A E R O  
ENGINES

**TITANINE**  
NON-POISONOUS  
**DOPE**  
SEE ADVERT. INSIDE.

**ACCLES & POLLOCK, LIMITED**  
SEE ADVERT. INSIDE.

WELDLESS STEEL TUBES — OLDBURY BIRMINGHAM

**TRIPLEX** Safety **GLASS**  
See Advt. inside.



. THE .  
**ENGINEERING TIMBER CO. Ltd.**

11, Victoria Street, London, S.W.

J. E. HUSON, Managing Director.

Telephone: Victoria—3073, 4210

Telegrams: Entikosil, Vic. London.

**SILVER SPRUCE**

**ASH**

**WEST VIRGINIAN SPRUCE**

**WALNUT**

**MAHOGANY**

**GLASGOW:**

**67, HOPE STREET.**

Telephone: Central 3273.

Telegraphic Address: Entikosil, Glasgow.

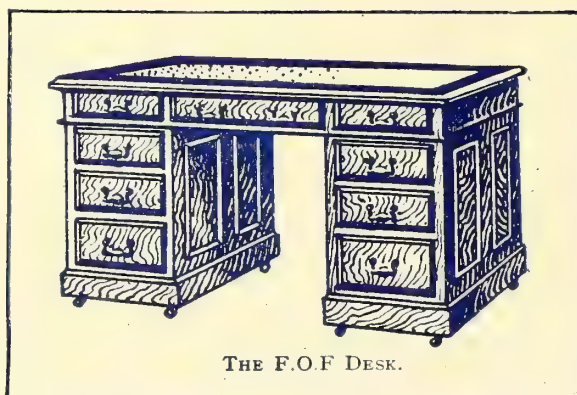
**PARIS AGENCY:**

**6, RUE DE HAVRE, PARIS.**

# Factory and Office Furniture

LARGEST STOCK FOR IMMEDIATE DELIVERY (NEW AND SECOND-HAND).

SPECIALITY



THE F.O.F. DESK.

SAFES.

# COOKE'S (FINSBURY) LTD.

FINSBURY PAVEMENT HOUSE,  
 LONDON :: :: E.C. 2.

Telephones : LONDON : 6179  
 WALL : 573

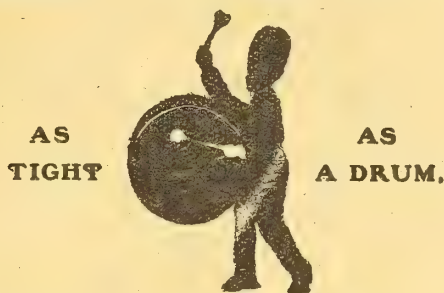
See Telephone Book relating to our  
 Shopfitting, Signs and other Departments

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# EMALLITE

NON-POISONOUS  
AEROPLANE DOPE.  
THE ORIGINAL AND STILL THE PREMIER.



Trade Mark.

THE BRITISH EMALLITE CO., LTD.,  
Contractors to the Air Board.

Registered Offices:

30, Regent Street, Piccadilly, S.W.1.

Wire—"Ridleyppren, Piccy, London."

"Phone—280 Gerrard

Works

5, Hythe Road, Cumberland Park,  
Willesden Junction, N.W.10.

Telephone—Willesden 2346 & 2347.

Metal  
Fittings  
a  
Speciality.

**The Aero Mechanical Co., Ltd.**  
CONTRACTORS TO THE AIR BOARD.  
60-66, ROCHESTER ROW, LONDON, S.W.1.

Telephone:  
Vic. 7570 (3 lines).

Managing Directors:  
E. Salomon, J. Fogelson

Complete Fittings  
and Dies in Stock for  
latest D.H. Machines;  
also most of the Fittings  
for other D.H. Machines  
and Handley-Page.

Our reputation has been built up by our ability to effect  
deliveries right up to time.

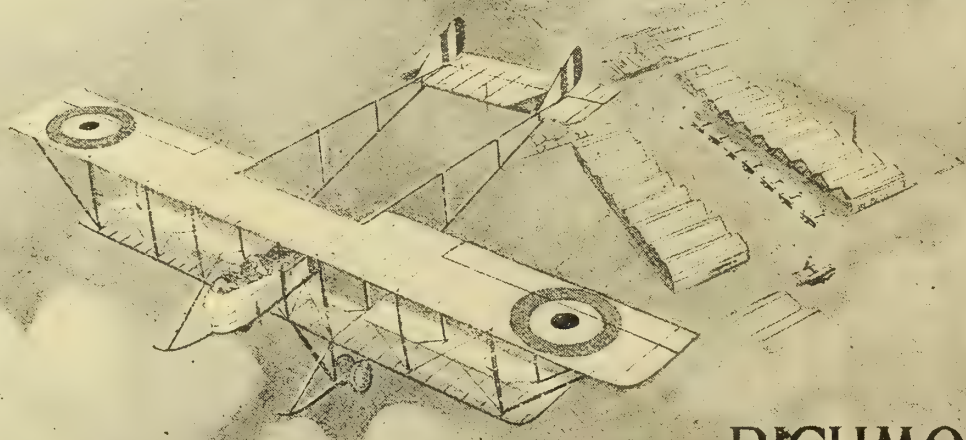
KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS





# WHITEHEAD

## AIRCRAFT



GEORGE WATSON  
1917

**RICHMOND**  
SURREY





CONTRACTORS TO  
H·M·AIR MINISTRY

Designers & Manufacturers of  
Aero Engines & Aeroplanes

*The*  
SIDDELEY-DEASY  
MOTOR CAR CO *Ltd*

*Coventry*  
*Luxurious Motor Carriages*  
*Aero Engines &*  
*Aeroplanes*



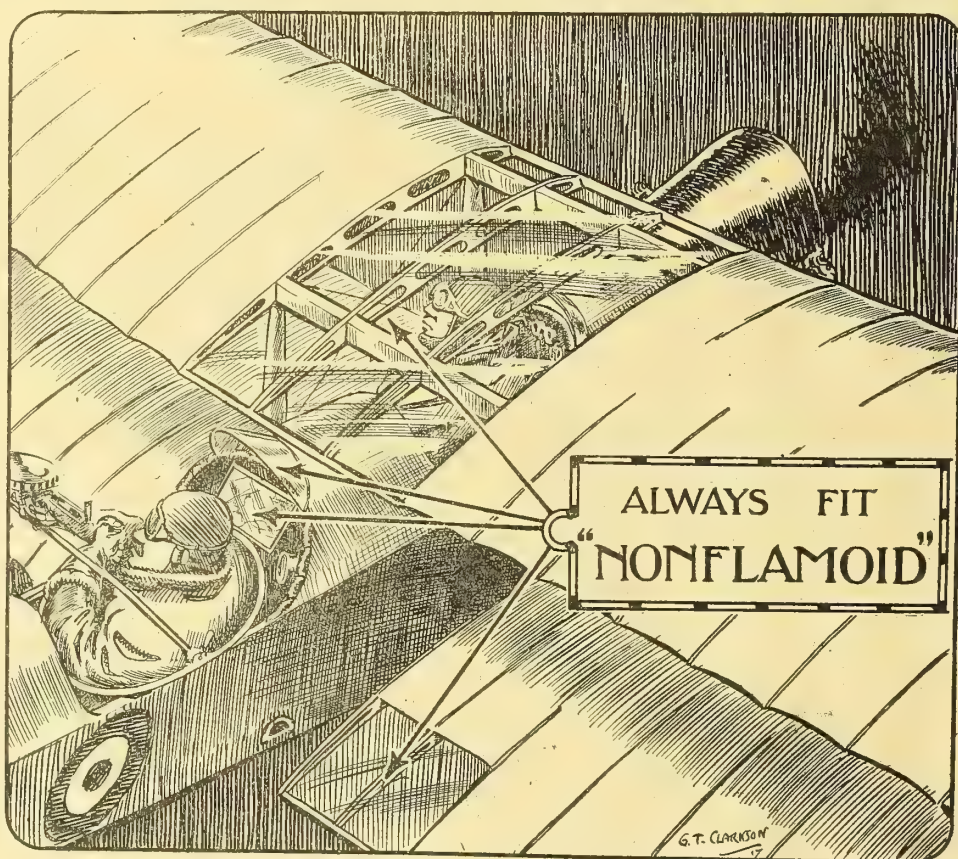
# "NONFLAMOID"

REGISTERED

**NON - INFLAMMABLE CELLULOID  
FOR  
WIND SHIELDS, WING COVERINGS  
OBSERVATION PANELS, & MAP COVERS**

## SPECIAL NOTICE.

We have on hand a considerable quantity of "Nonflamoid," in strips, 48in. x 7in., and can consequently give immediate delivery of Windscreens or Panels of dimensions not exceeding the above.



## The LONDON LABEL CO., Ltd.

*Contractors to H.M. Government,*

**HARLEY WORKS, BECKTON ROAD,  
LONDON, E 16.**

Phone—East 1300.

Telegrams—Lonlabel, Canning, London.



**CONTRACTORS TO THE  
ADMIRALTY & WAR OFFICE**

---

# **C. G. Spencer & Sons**

**LIMITED.**

**THE  
KITE BALLOON AND  
PARACHUTE EXPERTS**

**AERONAUTICAL APPARATUS  
OF EVERY DESCRIPTION.**

**ROPES, FABRICS AND EQUIPMENT.**

**THE PIONEER FIRM.**

**FIRST IN 1835.**

**FOREMOST TO-DAY.**

---

**Works: HIGHBURY, HACKNEY, BRIXTON, CLAPTON**  
**Head Office: 56a HIGHBURY GROVE, LONDON, N.**

**'PHONE: DALSTON 1893.**

**TELEGRAMS: "AERONAUT, LONDON."**



**NON-POISONOUS  
DOPE**

**TITANINE**



THE  
**BRITISH AEROPLANE  
VARNISH CO., LTD.**  
166, PICCADILLY, LONDON, W.1

Telephone . . . . . GERRARD 2312.  
Telegrams . . . . . TETRAFREE, PICCV, LONDON.



# HANDLEY PAGE LTD.

CONTRACTORS TO  
THE ADMIRALTY  
AND WAR OFFICE

CRICKLEWOOD,  
LONDON. N.W.2.

HAMPSTEAD 7500' 9 lines.

"HYDROPHID, CRICKLE," LONDON

## "AERO" YARNS FOR AIRCRAFT FABRIC

Established 1800



Lostock Junction Mills, near Bolton, England.

We have the longest experience in the trade in spinning Special Superfine Combed Yarns for manufacturers of Aircraft Fabric. We do not belong to any ring or combine. 263,000 Spindles.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



## **A. V. ROE & Co., Ltd.**

**Aeroplane  
Constructors.**

**NEWTON HEATH  
MANCHESTER.**

**Telephones—  
City 8530 and 8531.  
Telegrams—Triplane.**



**HAMBLE,  
near SOUTHAMPTON.**

**Telephone—  
Hamble 18.**

**Telegrams—  
Roe, Hamble.**

**AEROPLANES**

**AND**

**PARTS.**



**166, PICCADILLY,  
LONDON, W.1.**

**Telephone—  
Gerrard 3186.**

**Telegrams—  
Senalpirt, Phone.**

**CODE: A.B.C.: 5th Edition.**



# The AEROPLANE

The Editorial and Advertising Offices of "The Aeroplane" are at 166, Piccadilly, London W.1.  
 Telegraphic Address: "Aileron, London." Telephone: Mayfair, 5407.  
 Accounts, and all correspondence relating thereto, should be sent to the Registered Offices of  
 The Aeroplane and General Publishing Co., Ltd., Rolls House, Breams Buildings, E.C.4.  
 Subscription Rates, post free: Home, 3 months, 8s. 10d. 6 months, 7s. 7d.; 12 months, 15s. 2d.  
 Foreign, 3 months, 5s. 0d.; 6 months, 10s. 0d.; 12 months, 20s. 0d. Canada, 1 Year, \$4.70c.  
 U.S.A., 1 Year, \$5.20c.

## ON THE "MORNING POST" AND THE POLITICIANS

One wishes, as representing a section, at any rate, of the people who desire victory for this country in the present war, to congratulate the "Morning Post" on its triumph over Mr. Lloyd George and his hangers-on in its recent law action. To have taken the risk of total suppression, or other serious penalty, as the "Post" did, and then to be let off with a fine of £100—with another £100 fine for Colonel Repington—is equivalent of a verdict of a farthing damages in a libel case. It is far worse for the prosecutor than an acquittal, for in effect the Court says: "Technically the Defendant is guilty, but we have so low an opinion of the Prosecutor that we will only award him contemptuous damages."

Mr. George omitted to prosecute his friends' papers for a gross attack on the High Command of the Army, an attack which was liable to undermine gravely the confidence of officers and men in their leaders, and so to do serious harm to the moral of the whole Army. In fact, no greater assistance could have been given to the enemy on the eve of great movements.

But, as soon as our one remaining high-class newspaper attacks the schemes of politicians, Mr. George and his lawyer friends prosecute.

Obviously the "Morning Post" was technically guilty under the defence of the Realm Act. Happily the Court treated the matter as being purely technical and let it go at that.

Thus Mr. George receives distinct notification that he and his friends are estimated at their true value in those Courts where politico-legal influences do not prevail. Doubtless Mr. George is under the impression that, if he has never won the confidence of the better-class people of this country, and if he has lost whatever faith the bourgeoisie had in him, he still retains the love and admiration of the working man, and so still has Demos behind him. Nothing, in fact, is further from the truth.

Mr. George is regarded, and rightly regarded, by the working man as an upstart. If anyone wishes to test the truth of the statement, let him question any West Country workman on the subject of the wedding of Mr. George's son at Bath, to which Mr. George was reported to have travelled by motor-car.

The working man regards Mr. George's use of petrol on that journey as a gross impertinence, and an insult to the working classes.

If a General Officer, or a local nobleman or gentleman—say the Duke of Beaufort—had made the journey by car, the working man would have regarded it as merely the prescriptive right of such people. But when Mr. George does the same thing the working man resents it. None is keener to recognise class distinctions than is the working man, and he regards Mr. George as a renegade from his own class. Also he does not forget

Mr. George's connection with the Marconi affair before the war, and distrusts all his actions accordingly.

The British Nonconformist Conscience is a strange thing. It ruined the career of one of our greatest statesmen, the late Sir Charles Dilke, over an entirely unproved *affaire passionnel*, and yet it accepts as the leader of the Empire one of the chief actors in a very shady financial transaction. It is, of course, worthy of the people who ostracise from the local chapel a girl who has been seen out late at night with a young man, and accept as a leading spiritual light the local grocer who is known to put sand in his sugar and to rob the widow and orphan with false weights. If Mr. George still imagines that he has the working man behind him, he will probably find that the workman's posterior position is merely for the purposes of pedal propulsion.

One has not the honour of knowing any person on the staff of the "Morning Post," and one can therefore say without bias that Colonel Repington and Mr. Gwynne, the editor, have done a great service to the British Empire and still greater service to the British Army and to the soldiers of the Overseas Dominions. Also, they are to be congratulated on having been the means of proving that in the opinion of an honest judge their several crimes, and inferentially Mr. George's reputation as a statesman, are only worth the sum of £100.

As Colonel Repington himself said recently, there comes a time, sooner or later, when everyone has to go "over the top." The "Morning Post" has gone over the top with marked success, and has come off with the merest flesh-wound, not even a "Blighty" one. And, in return, it has made an ugly dent in the defences of the political enemy, forcing him to disclose the locality of his reserves and supports. As a result, we who are trying to win the war now know considerably more about the disposition of the enemy political forces.

Many honest and patriotic people fear greatly lest the political demise of Mr. George should bring revolution and anarchy in this country as in Russia. Nothing is, in fact, less probable. Such people hold that we have no statesmen at all, and that we have not even a politician capable of taking Mr. George's place. To such people one would merely point out that the absence of politicians is a blessing and that the absence of statesmen is no unmixed evil. In time of war, and of national peril, the Army is the only thing that matters.

Happily we have an Army, and the Chiefs of that Army are perfectly capable of winning the war and of governing the country without any politicians, if forced to do so. In fact, it is certain that the Army would govern very much better than the politicians have done. Frankly, one hopes to see, in due course, a purely Military Government. Then we may proceed with the war decently and in order.—C. G. G.



## THE AIR FORCE MEMORANDUM.

Hereafter follows the official Memorandum issued last week which lays down the positions of officers and men of the Air Force. It is understood that the Memorandum has been issued to the whole personnel of the Force, but it seems well to reproduce it here, so that the facts may be available to all who have dealings with Service aviators, either socially or commercially.

Those who have been responsible for the organisation of the Air Force deserve congratulations on their work. It is particularly gratifying to find that the Army has been strictly followed as a model, both in system and in nomenclature, and that no attempt has been made to coin fancy names for Air Force ranks. Among the people of the Old Army there was considerable apprehension on this point. Humorous suggestions that the C-in-C. Air Force should be known as the Heliarch, that his immediate subordinates should be called Air-mirals, and that sundry other equally weird titles should be adopted, were of the nature of the resigned smile which covers real pain.

It is too much to expect that our terminologically inexact press will cease from calling military aviators flight-lieutenants, but with this Memorandum before them journalists can now have no excuse for error, and intelligent people will be able to clear their minds of any doubt as to the correct form of address when corresponding with friends in the Air Force. One presumes that in correspondence the Army custom will be followed, and that an officer below the rank of Captain will be addressed as "So-and-So, Esq.—Lieutenant, Air Force"—or perhaps the name of his unit, when names are given to units, as they are to regiments in the Army—and that the Naval formula, which would be "Lieut. So-and-So—Air Force," will not be used.

### ARMY INFLUENCE.

The Memorandum as a whole distinctly conveys the impression that Army influence dominates the new Force, which is entirely satisfactory. Everyone fully recognises the magnificent work done by units of the Royal Naval Air Service, especially when they have formed practically independent commands under young and energetic officers, but wherever the influence of the Admiralty has been felt in the past in connection with aviation the effect has been truly lamentable.

What might happen in the future under a reorganised and enlightened Admiralty none can guess. One can only judge by the past, and when one proceeds to do so the predominance of the Army in the Air Force gives one all the more confidence in the ability of this country to hold the command of the air in time to come. The Army has always been the Cinderella of the Services. Now, for the first time in history, officers of the Army find themselves in control of a great Force which has the backing of the whole country when it demands more men and matériel. The certainty that such supplies will be employed efficiently, and according to the best strategic and tactical methods, by those who control the Air Force will greatly encourage all the King's subjects who are desirous of winning this war.

### NAVAL POSSIBILITIES.

It seems probable that in time the personnel of the Airship section, and the personnel and matériel of the sea-going section of the Air Force, will revert entirely to the Navy. This may not happen till after the war, or it might happen at once. In any case, the sea-going section will operate under the command of the Admiralty.

One hopes that—with the lessons of the past before them—their Lordships of to-day will display more intelligence than those of the past, and will not, for in-

stance, condemn seaplanes to operate in dangerous waters from ten or fifteen knot converted tramp steamers, nor decree that progressive wing and squadron commanders shall be repressively controlled by elderly gentlemen of devastating incapability. There are great possibilities for sea-going aviators, not merely in suppressing submarines, but in actively offensive operations—as witness the wholly unacknowledged and unpublished work of the R.N.A.S. detachments along the coast of Palestine, which are perfectly well known to the Turks and Germans, and are entirely hidden from the people of this country.

### A BRIGHT OUTLOOK.

In a general way the outlook for everyone concerned with Service aviation has never been so bright as to-day. Compared with the Army, officers and men of the Air Force are, if anything, overpaid, for the lot of the aviator in war is in every way preferable to that of the infantryman, and the life of an Air Force private is that of a gentleman compared with the existence of the P.B.I. of the Line.

R.N.V.R. officers, attached R.N.A.S., now come into their rights, and are adequately paid for their work. The treatment of the R.N.V.R. officer by the Admiralty is one of the scandals of the war. It is true that a number of R.N.V.R. uniforms cover the worst cases of trench-dodging in the country—and not all of them are attached R.N.A.S. by any means. Also the sudden promotion to two-and-a-half stripes, on the advent of the Air Force, of a number of people who have never done any more than wear their uniforms shiny on office chairs is a matter which is causing much heart-burning. But against this, happily, a greater number of gallant and patriotic gentlemen who have served His Majesty bravely on active service—on seaplane carriers, at advanced aerodromes, as experimental officers under dangerous conditions, and in highly responsible positions, now become officers of the Air Force as the equals of those alongside whom they have hitherto worked as inferiors for one-third of the pay.

It is regrettable that the Admiralty does not behave equally generously to the thousands of R.N.V.R. officers who, with their paltry stipends, are doing the full work of R.N. officers in the Navy's irregular branches, and are taking daily far greater risks than are run by any of the personnel of the Grand Fleet.

As regards the officers and men of the R.F.C., their position is not changed, but they will be heartened and encouraged by the knowledge that their future is in the care of those officers who have led them through so many difficulties to their present dominating position in the air in all war areas, and that the power now possessed by those officers is greater than has ever seemed possible for it to become.

### THE MATTER OF UNIFORM.

The prospects of having to wear the quaint new uniform, which appears to have been perpetrated by one of those curious beings whose operations as "Naval Out-fitters" seem to have resulted in the average Naval officer being the worst dressed of the King's servants, are mitigated by the fact that military uniforms may be worn by present officers of the R.F.C. until worn out. It seems that the wearing-out process will consume much time.

Doubtless the designing of the uniform was left to the Navy in return for allowing the Army to design the organisation of the Air Force. Dress was ever the lowest form of soldiering, as a distinguished officer remarked, but those who take reasonable interest in their



personal appearance can, no doubt, assure the new uniform being passably eyeable by having it made by a military tailor and not by an outfitter.

The official abolition of the "Sam Browne" is to be regretted, and one is glad to notice that the abolition is strongly resented. The fact that French, Italian, and even American officers have taken to wearing the Sam Browne in order to establish their position as officers, should be sufficient argument for its official reinstatement. Probably if Air Force officers insist on wearing the revered belt custom will cancel the regulation.

#### AN IMPERIAL MATTER.

Some anxiety is also felt about the Air Force buttons. Two Royal Services, the R.N.A.S. and R.F.C. cannot surely be merged into a mere Air Force. The new Force must be either Royal or Imperial. It cannot well be Imperial without an Act of Parliament to repeal the conditions under which our King holds the title of Emperor of India, without the right to use the word Imperial in relation to British affairs.

Constitutionally there is no such thing as the British Empire. Therefore the King's Forces cannot legally bear the title Imperial, though it seems that the Forces of the Overseas Dominions may so label themselves if they are so loyally pleased.

Thus, the only possibility seems to be that the Air Force must become the Royal Air Force, which means that the officers and men must wear buttons bearing the initials R.A.F., and so become confused with R.A.F. engines and Rafwires and such things.

One would strongly advocate the introduction of a short Bill into Parliament, to empower the use of the title "Imperial Air Force." Then the military branch could retain the honoured name and tradition of the R.F.C., with the uniform of the Corps. The Naval side could likewise maintain the R.N.A.S. And the air people pure and simple, operating apart from Navy or Army, could coin a new title for their branch.

There are many other points which one would like to discuss, but lack of space forbids. Whatever happens, the operations and the administration of the Air Force are in excellent hands. The officers and men have the fullest confidence in their leaders, and the leaders are worthy of those under them. Little things like names and uniforms sort themselves out in course of time, through continual minor agitations. The great thing is that this country is right at the top in Air Power today, and present conditions very clearly indicate that, provided due support is given to those now at the head of affairs, our position as the leading Power in the air will be maintained in the future.—C. G. G.

### AIR FORCE MEMORANDUM No. 1.

#### TRANSFER OF THE ROYAL NAVAL AIR SERVICE AND ROYAL FLYING CORPS TO THE ROYAL AIR FORCE.

*This pamphlet is issued by the Air Council in order to give officers and men now serving in or attached to the Flying Services a general view of the conditions of service in the Air Force, together with a statement of the rates of pay, etc., which will be in force.*

#### PROCEDURE FOR CONSTITUTION OF THE AIR FORCE.

1. The Air Force (Constitution) Act, 1917, provides that any officer, warrant officer, petty officer, non-commissioned officer or man who, on a date to be prescribed, belongs or is attached to the Royal Naval Air Service or the Royal Flying Corps, may be transferred or attached to the Air Force without his consent. This date will be fixed by Order in Council.

2. It is also provided that any person transferred or attached may, within three months from the time when he receives notice of such transfer or attachment or such longer period as in any particular case the Air Council may allow, give notice to his commanding officer that he does not desire to be so transferred or attached, and in that case the transfer or attachment is to be annulled without prejudice to the validity of anything which may have been done in the meanwhile.

3. The date from which transfer or attachment takes effect will be fixed by an Order of the Air Council, which will be made with the consent of the Admiralty and Army Council, and will be promulgated in the various commands, theatres of war and countries overseas, where members of the flying services are serving. Transfer or attachment will take effect on the date prescribed in the Order of the Air Council. The period of three months referred to in para. 2 will run from the date prescribed in the Order of the Air Council or, in cases where this Order is not promulgated until after the date prescribed in the Order, from the date of such promulgation.

4. Officers and men will become subject to the Air Force Act from the date of their transfer or attachment to the Air Force.

5. The Act provides that the duration of attachment to the Air Force shall be the period of the present war, or a period not exceeding four years, and that no person transferred shall be liable to serve with the Air Force for any longer period than that for which he would have been liable to serve had he continued in the Force from which he was transferred. Officers and men attached will be kept for whichever period (duration of war or four years) is the longer.



THE FOUNDATIONS OF THE AIR FORCE.—A typical R.F.C. Mess in the Field: In this case in Italy.



\*6. In the case of any person transferred to the Air Force, for the purposes of pay, pensions, gratuity, and retired or half-pay, and of any decoration or reward dependent on length of service, any previous service with His Majesty's naval or military forces which would have counted as service towards pay, pension, gratuity, retired or half-pay, or such decoration or reward if he had not been so transferred, will be deemed to be service with the Air Force towards pay, pension, gratuity, retired or half-pay, or such decoration or reward.

\*7. In the case of any person attached to the Air Force, the fact that he is so attached will not affect any right to any pay, pension, gratuity, retired or half-pay, or such decoration or reward as aforesaid, already earned by him in that branch of His Majesty's naval or military forces to which he belonged at the date on which he was so attached, and the period during which he is so attached shall, for the purpose of any provisions relating to pay, pensions, gratuity, retired or half-pay, or such decoration or reward, be deemed to be service with that branch of His Majesty's naval or military forces to which he belonged at the date on which he was so attached.

#### CONDITIONS APPLICABLE TO ALL RANKS.

7A. Every officer or man serving in the Air Force will, if medically fit, be liable to be called upon to go into the air, either in airships, aeroplanes or kite balloons.

7B. Every officer or man serving in the Air Force will be liable to be ordered to any station, at home or abroad, if considered medically fit for such service.

#### GENERAL RULES AS TO EMOLUMENTS—ALL RANKS.

8. While it is impossible to pledge the future as to the prospects of individuals, and while reasonable latitude must be reserved to the Air Council to deal with any privileges or emoluments (such as allowances) which are not subject to vested

\* The position of officers of the Indian Army and of the Indian Army Reserve transferred or attached to the Air Force is being specially considered with reference to the provisions of these two paragraphs. In the meantime this memorandum must not be taken as determining finally anything as to the manner in which officers of the Indian Army will be treated regarding pay, pension, promotion, etc., on transfer or attachment. Officers of the Indian Army and Indian Army Reserve will in due course be informed individually what their position will be on transfer or attachment.

rights, it may be taken as a governing principle that no officer or man will suffer during the war by reason of transfer to the Air Force, in respect of the pay and pension of the substantive, temporary or acting rank held by him in the Navy or Army immediately before transfer; an officer or man, however, may be required to relinquish his temporary or acting rank under the existing rules of the Services. Nor will officers or men suffer through any revision of the rates after the war in respect of the pay and pension of the substantive rank held by them on the date of such revision. At the same time it must be borne in mind that certain concessions in regard to emoluments in the Navy and Army have only been authorised for the period of the war, and this limitation must equally apply to such emoluments in the Air Force. Officers and men who are merely lent, as a purely temporary measure, to the Air Force, are not dealt with in this pamphlet.

9. SCALES OF PAY.—The rates of pay of officers and other ranks in the Air Force are set out in Appendices IA, IB, IC, and IIA, IIB, IIC, which also show the corresponding ranks and appointments in the existing Flying Services.

All officers who are transferred or attached to the Air Force will (subject to their not drawing less than their existing rates under para. 8) be paid at the rate of pay appropriate to the appointment in the Air Force to which they are assigned and not necessarily at the rate of pay in the Air Force which their own rank would carry under Appendix IA. They will, of course, draw the rate which their rank would give under that Appendix if and when they take up an appointment to which that rank is appropriate. All officers who are attached to the Air Force for instruction will draw the pay of which they were in receipt at the time of the transfer of their attachment to the Air Force, plus instructional rates of flying pay until they qualify.

10. GENERAL RULE AS TO ALLOWANCES.—Allowances generally will be at Army rates and under Army regulations. These allowances will be reviewed from time to time as may be necessary, to adapt them to the circumstances of the Air Force. Typical rates are shown in Appendix III, as a general guide. Navy allowances (other than separation allowance) will apply in the case of officers and men while actually borne on the books of His Majesty's ships.

11. OFFICERS' CHILDREN'S ALLOWANCE.—This allowance will be issuable during the war at the same rates and under the conditions already authorised. (See Appendix III.)

### APPENDIX IA—PAY OF OFFICERS.

1. The rates of pay (and classification for allowances) of officers of the Air Force are as shown in the following table. The annexed tables (Appendices IB and IC) show the Air Force rank into which the various ranks or appointments in the present Flying Services will be translated.

Classification for Allowances (see App. III).	Rank.	Staff on Air Force Commands Yearly Rates (Consolidated).*	Flying Branch		Technical Branch		Administrative Branch.†
			Daily Rates		Daily Rates		Daily Rates
		£	Basic	Flying	Basic	Technical	
1-2	General	2,500	—	—	—	—	—
3	Lieutenant-General	2,000	—	—	—	—	—
4	Major-General	1,500	—	—	—	—	—
5-6	Brigadier-General	1,000	—	—	—	—	—
7-8	Colonel	900	—	—	—	—	35s.
8	Lieutenant Colonel	750	40s.	—	(Class A, 40s.) (Class B, 35s.)	—	24s.
10	Major	550	32s.	—	24s.	—	21s. 4d.
12	Captain	500 400	19s. After 1 year's service in the rank 20s.	8s.	17s. 1s. additional for each completed year's service in the rank up to a maximum of 20s.	2s. 4s., 6s. or 8s.	15s. 6d. 17s. 6d. after 3 years' service in the rank, subject to 12 years' total service.
14	Lieutenant	350 300 250	12s. 1s. additional for each completed year's service in the rank, up to a maximum of 16s.	8s.	12s. 1s. additional for each completed year's service in the rank, up to a maximum of 16s.	2s. 4s. or 6s.	11s. 6d.
14	Second Lieutenant	—	10s.	8s. 4	10s.	2s. or 4s.	10s. 6d.
14	Probationers	—	7s. 6d.	4s.	7s. 6d.	Nil.	7s. 6d.

\* These rates are subject to deductions when the officer is provided with public quarters.

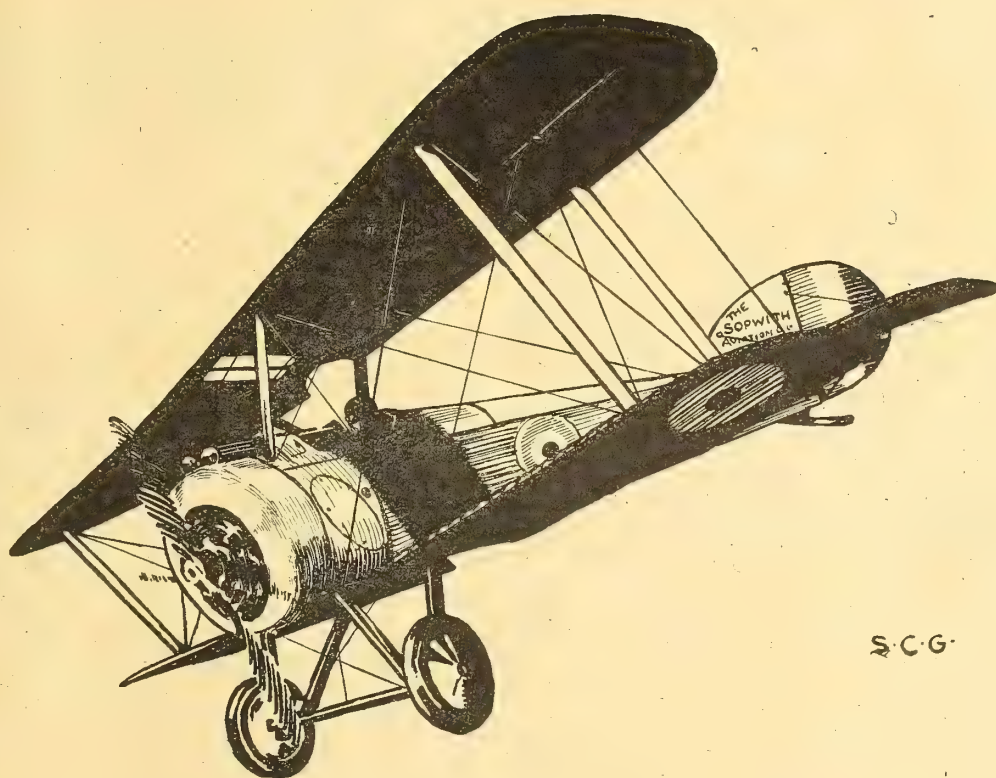
† Including Instructional Officers, non-flying and non-technical.

‡ Subject to graduation as Pilot, up to which time 4s. will be drawn.

NOTE.—"Service in the rank" in the above table (in the case of officers joining from the existing services) means service in the appointment, e.g., service in the rank in another arm of the service would not reckon, nor would service given in a Flying Services appointment carrying a lower rank.



# THE SOPWITH



S.C.G.

**AVIATION COMPANY, LIMITED**  
**KINGSTON-ON-THAMES, ENGLAND.**  
**CONTRACTORS TO H.M. GOVERNMENT.**

Telephone: KINGSTON 1988 (8 lines).  
Telegrams: SOPWITH, KINGSTON:



Paris Office:  
21, RUE DU MONT THABOR.



12. SEPARATION ALLOWANCE. MEN.—Separation allowance will be issuable at Army Rates.

Appendix III shows how the allowances in the case of men transferred from the Navy will be adjusted on transfer.

13. DISABILITY PENSIONS.—These are administered by the Ministry of Pensions. The general position is that no officer or man will lose in his present rank on transfer.

14. PENSIONS FOR LENGTH OF SERVICE, HALF-PAY, ETC.—See para. 7 above. Details of pensions for length of service, of half-pay, etc., have not been finally settled, but a general guarantee is given that pension rights for officers on a permanent commission, or men on a regular engagement, transferred or attached to the Air Force, will be at rates not less favourable than those that can be earned in the Navy and Army.

#### APPENDIX IA (continued).

2. The rates for Staff Officers are shown as consolidated only, but it may be necessary to arrange that the emoluments of Staff Officers abroad shall be issued in the usual form of ordinary pay and local allowances.

3. Special inclusive rates of pay for certain classes of temporary officers, such as acting paymasters or officers engaged on a commercial basis, continue as hitherto, in respect both of pay and of allowances, unless and until they are given an ordinary Air Force commission with the appropriate rate of pay of the rank.

4. Similarly, existing quartermasters, if transferred, will continue at existing rates, unless appointed to an Air Force rank.

5. Flying pay is not issuable to officers on consolidated rates, but otherwise the regulations governing the issue of flying pay will continue subject to any necessary modifications in detail. Details will be published in Air Force regulations in due course.

6. The existing rights of Reserve officers of the Flying Services to the gratuity of £150 for each year of service will continue, as also will the right of temporary officers of the Army to the gratuity based on length of service under the Pay Warrant.

7. The pay of officers will be issued in arrear. In order to overcome any inconvenience thus caused to army officers now drawing pay in advance, the agents will be authorised to issue to such officers, on application being made, an advance of any gratuity to which they may be entitled under the Pay Warrant on the expiration of their service. The advance will not exceed one month's pay. In the case of officers not entitled to a gratuity as above, the agents will advance one month's pay, on request, for a period not exceeding six months, without interest.

8. The following firms have been appointed Air Force agents for the issue of Pay and Allowances to officers of the Air Force:—

15. INCOME TAX.—Steps have been taken to secure for officers and men of the Air Force Income Tax reliefs similar to those granted under recent Finance Acts to members of the naval and military forces.

These reliefs include reduced rates of tax, exemption where the total income does not exceed £160, an abatement allowance of £160 where the total income does not exceed £300, etc.

16. PRIZE MONEY AND PRIZE BOUNTY.—Officers and men of the Royal Navy and R.N.A.S. if entitled, at the date of transfer or attachment to the Air Force, to prize money under the regulations which may be approved for its distribution, will not forfeit their claims by such transfer or attachment.

17. WAR GRATUITY.—The position of officers and men of the Army transferred or attached to the Air Force will not, by reason

Messrs. Cox & Co., 19, Charing Cross Road, London, S.W., for Staff and Flying Branch.

Messrs. Holt & Co., 3, Whitehall Place, London, S.W., for Technical and Administrative Branches.

The present practice of issuing the pay of R.N.A.S. Officers through Naval Paymasters will cease. Instructions will shortly be issued for general guidance as to the opening of individual accounts with Air Force agents and as to the time and method of giving effect to the change referred to in para. 7.

9. The issue of allotments of pay by the Admiralty on behalf of Naval Officers transferred or attached will, of course, cease. It will be possible for officers to make their own arrangements for such allotments with their agents. Payments in respect of children's allowance will be made through the agents.

10. A certain number of R.F.C. Officers performing non-technical administrative duties were graded on appointment or promotion as E.O.s. or Park Commanders. Such officers will, under the new régime, be appointed Administrative Officers, and be paid as such, subject to reserved rights to existing rates of pay if higher.

11. Commissioned Warrant Officers and Warrant Officers of the Navy come over as commissioned officers of the Air Force. They are at present entitled to (Navy) rates of separation allowance and in some cases to store allowance, and as their pay in the Air Force plus officers' children's allowance may be less than their total Naval emoluments, their case will be dealt with as follows. Where the total Air Force emoluments are more beneficial, they will be drawn. Where they are less beneficial the officers will continue to receive the Navy pay and separation allowance, etc., which they are at present drawing. When for any reason the Air Force emoluments become more beneficial, e.g., on promotion, the Navy emoluments will be finally cancelled.

#### APPENDICES IB AND IC.

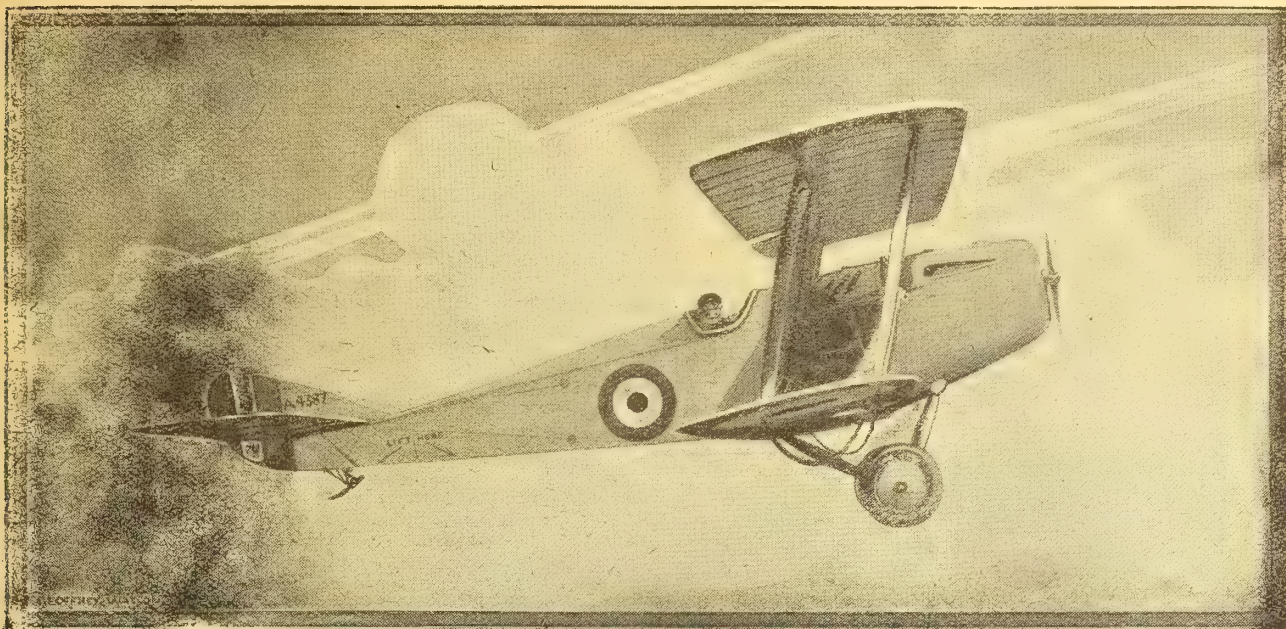
##### PRESENT RANKS AND GRADINGS.

R.N.A.S.			R.F.C.		
Flying.	Technical.	Administrative.	Flying.	Technical.	Administrative.
Wing Cmdr	Cmdr. R.N.V.R.	Fleet Paymaster.	Wing Cmdr (Lt.-Col.).	Depot Cmdr. (Lt.-Col.).	
Wing Observer.		Naval Instr. of 15 yrs. senry. Cmdr. R.N.V.R.			
Sqdn. Cmdr. (Lt. or Lt.- Cmdr.)	Lt.-Cmdr. R.N.V.R.	Staff Paymaster.	Sqdn. Cmdr. (Major).	Park Cmdr. (Major).	
Sqdn. Observer.		Naval Instr. of 8 yrs. senry			
Flt. Cmdr. (Lieut.).	Lieut. R.N.V.R.	Paymaster	Flt. Cmdr. (Captain).	E.O. (1) (Captain).	Wing Adjt. (Captain).
Flt. Observer.		Asst. Paymaster of 4 yrs. senry. Naval Instr.			
Flt. Lieut. (Lieut.)	W.O., 1st Class.		Flying Officer, 2/Lt. or Lt. Flying Officer Observer (2/Lt. or Lt.).	E.O. 2 (Lieut.).	A./Adjts draw pay of sub- stantive rank plus extra duty pay
Observer Lt.					
Flight Sub.-Lt. Observer Sub.- Lt.					
	W.O., 2nd Class.			F.O. 3 2/Lieut.	
Probationary Ft. Officer.			2/Lieuts. on probation.		
Probationary Observer Officer.					

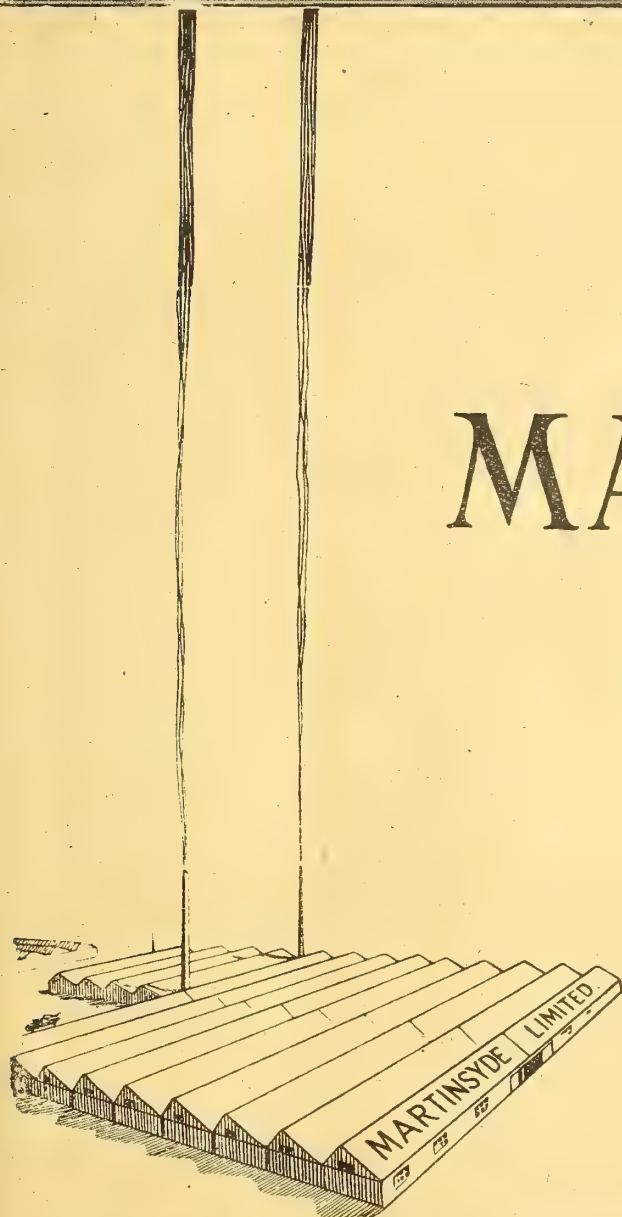
##### RANKS AND GRADINGS IN NEW AIR FORCE.

	Flying.		Technical.		Administrative.
	Rates per day.		Rates per day.		Rates per day.
	Basic.	Flying.	Basic.	Technical.	Basic.
Lieut.-Col. ...	40s.		Class A, 40s. Class B, 35s.		24s.
Major ...	32s.		24s.	2s., 4s., 6s. or 8s.	21s. 4d.
Captain ...	Ft. Cmdr., 19s. After 1 year's service in the rank, 20s	8s.	E.O. (1), 17s., 1s. additional for each com- pleted year's service in the rank up to a maximum of 20s.	2s., 4s., 6s. or 8s.	15s. 6d., 17s. 6d. after 3 years' service in the rank, subject to 12 years' total service.
Lieutenant ...	F.O. Pilot, F.O. Observer, 12s., 1s. additional for each com- pleted year's service in the rank up to a maximum of 16s.	8s.	E.O. (2), 12s., 1s. additional for each com- pleted year's service in the rank up to a maximum of 16s.	2s., 4s. or 6s.	11s. 6d.
2nd Lieut. ...	F.O. (on gradn.), 10s	8s.	E.O. (3), 10s.	2s. or 4s.	10s. 6d.
Probationers	7s. 6d.	4s.	7s. 6d.	Nil.	7s. 6d.





# MARTINSYDE



Aerodrome and  
Auxiliary Works:  
BROOKLANDS.

Head Office  
& Works:  
WOKING, Surrey.





of their transfer or attachment, be altered as regards any claim they might otherwise have had to participate in any war gratuity, the issue of which may hereafter be sanctioned by His Majesty's Government.

#### CONDITIONS APPLICABLE TO ALL OFFICERS.

18. All officers transferred or attached on the formation of the Air Force will be placed on a gradation list, which will fix their seniority in the Air Force.

In drawing up the Gradation List consideration has been given to the permanent, temporary or honorary rank held by each officer.

In the case of officers holding permanent commissions in the Navy or Army, the permanent rank has been the first basis.

#### APPENDIX IIA—PAY OF MEN.

1. THE RATES OF PAY of warrant officers, non-commissioned officers and men of the various branches of the Air Force are shown in the attached table. Appendices IIB and IIC show the Air Force rank into which the various ranks and ratings of the existing Flying Services will come.

2. RATES OF FLYING PAY remain as at present:—

First-class	...	...	...	4s.
Second-class	...	...	...	2s.
Under instruction	...	...	...	1s.

with special rates for men employed in airships, and kite balloons, on acceptance and observation duties, etc. These special rates will be liable to certain modifications.

3. INCREASES FOR WAR SERVICE.—The increase of 1d. a day for each year of service, given to the Army as "War Pay," is not applicable to the Air Force, as the rates were specially fixed so as to render such a grant unnecessary. The following classes, however, will be entitled to War Pay, under conditions already announced for the Army:—

- Boys at 1s., privates, 2nd Class, and clerks, 3rd Class.
- Men who come over from the R.F.C. at their existing Army rates of pay and who would have been entitled to War Pay under Army regulations. Such men will retain it during the war until it is absorbed by increases for length of service or on promotion. Those coming over on a higher rate of pay may draw their Army pay and War Pay if these together would be more beneficial.

It should be noted that service in the Navy or Royal Marines does not count towards War Pay.

4. ALLOTMENTS OF PAY.—The recent concessions will apply as follows:—

- To men from the Army—as already authorised for men now serving in the Army.

TABLE OF RATES OF PAY (AND CLASSIFICATION FOR ALLOWANCES) OF WARRANT OFFICERS, N.C.O.s AND MEN OF THE AIR FORCE  
(Referred to in para. 1 above.)

Technical.		Non-Technical		Clerks, Storekeepers, etc.		Classification for Allowances (see App. IIB).
Rank.	Daily Rate of Pay.	Rank.	Daily Rate of Pay.	Rank.	Daily Rate of Pay.	
A. Chief master mechanic, 9s. + 3s. ...	12s.	Serjeant-major, Class I ...	7s. 6d.	Master clerk ...	6s. 9d.	15
Master mechanic, 9s. + 2s. ...	11s.	Serjeant-major, Class II ...	6s. 9d.			16
B. Chief mechanic—		Flight-serjeant—		Flight clerk ...	5s. 6d.	19
Commencing rate of pay ...	7s.	Commencing rate of pay ...	3s. 10d.			
After 3 years' service in the rank ...	8s.	After 3 years' service in the rank ...	4s. 1d.			
After 6 years' service in the rank ...	9s.	After 6 years' service in the rank ...	4s. 4d.			
C. Serjeant mechanic—		Serjeant—		Sergeant clerk ...	4s. 9d.	19
Commencing rate of pay ...	6s.	Commencing rate of pay ...	3s. 3d.			
After 3 years' service in the rank ...	6s. 6d.	After 3 years' service in the rank ...	3s. 5d.			
After 6 years' service in the rank ...	7s.	After 6 years' service in the rank ...	3s. 7d.			
D. Corporal mechanic—		Corporal—		Corporal clerk ...	4s.	20
Commencing rate of pay ...	5s.	Commencing rate of pay ...	2s. 4d.			
After 3 years' service in the rank ...	5s. 6d.	After 3 years' service in the rank ...	2s. 6d.			
After 6 years' service in the rank ...	6s.					
E. Air mechanic, 1st Class—		Private, 1st Class—		Clerk, 1st Class ...	3s.	20
Commencing rate of pay ...	4s.	Commencing rate of pay ...	1s. 8d.			
After 3 years' service in the rank ...	4s. 6d.	After 3 years' service as a private over 18 years of age ...	2s. 0d.			
After 6 years' service in the rank ...	5s.					
Air Mechanic, 2nd Class—		Private, 2nd Class—		Clerk, 2nd Class ...	2s.	20
Commencing rate of pay ...	3s.	Commencing rate of pay ...	1s. 6d.			
After 3 years' service ...	3s. 6d.			Clerk, 3rd Class ...	1s. 8d.	
Air mechanic, 3rd class—						
Commencing rate of pay ...	2s.					
F. Boy—		Boy—		Boy clerk ...	1s.	20
Commencing rate of pay ...	1s.	Commencing rate of pay ...	1s.			

Note.—"Service in the rank" includes service given in the corresponding rank in the Navy and Army in the case of men now to be transferred or attached

If the existing rate of pay of any man is higher than the rate which he would draw under the above table, he continues to draw that higher rate until it is absorbed by increased pay on promotion or otherwise, unless disrated for other reasons.

Certain promotions have, however, been made in cases where officers have been advanced in temporary rank more than one grade, or have held temporary rank (while holding appointments carrying temporary rank) for a certain period.

In grading temporary officers consideration has been given to their temporary or acting rank, whether gained in the R.N.A.S. or R.F.C. or in other branches of the Services. Unless for exceptional reasons, those who have not held their present temporary rank for more than a certain period are graded in the rank below, and given temporary rank of their present grade.

Owing to the difference between old and new ranks and scales of pay, it has been found that certain officers, if graded in their present permanent or temporary rank, would receive pay of ap-

(b) To men from the Navy—the benefit of the Army system will be given. No allotment will be charged against the man's pay in respect of the amounts due as separation allowance or dependants' allowances under Army scales and regulations. As a temporary measure, however, the present allotment will continue to be charged against the men's accounts until the reassessment is completed: this will take some considerable time; any arrears due to the men in respect of allotments so charged will be made good to them. (See Appendix III, para. 9.)

5. MEN ON SPECIAL RATES OF PAY.—Following the present practice such men are not entitled to the concessions given under paras. 3 and 4 above—e.g., men of the R.F.C. in Canada drawing a special allowance while serving there.

6. ARMY GRATUITIES.—The gratuities given under Army Regulations to soldiers on transfer to the Army Reserve or on discharge will continue to be issuable, and will be extended to men from the R.N.A.S. with effect from the date of joining the Air Force. These gratuities are at the rate of £1 for each year of service. Transfer from the Army to the Air Force is not a "Discharge" for purposes of this gratuity.

7. GOOD CONDUCT BADGES AND PAY.—Good Conduct Badges will not be granted in the Air Force. Men who are already in possession of Good Conduct Badges carrying additional pay will be dealt with as follows:—They will be guaranteed a rate of pay not less than the total of the ordinary and Good Conduct Pay now drawn. This rate (with any good conduct pay contained in it) will be cancelled by any higher rate to which the man may be appointed on transfer, or on subsequent promotion or otherwise.

8. PERMANENT ADDITIONAL EMOLUMENTS (NAVY).—In the same way men drawing non-substantive pay, detained pay, re-engaged or extension pay and the like will be entitled to retain their naval rate, including these extras, under Naval Regulations, where the naval total is more beneficial than the Air Force pay. The additional pay will, however, drop out and be cancelled as the men come on to more beneficial rates in the Air Force either on appointment, or on subsequent increase on promotion, etc.

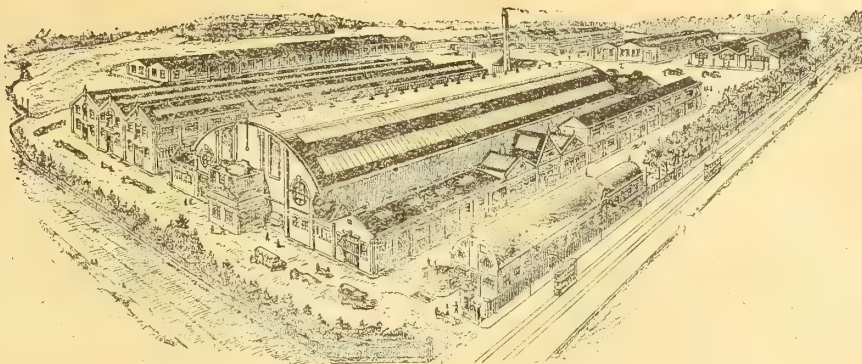
9. ROYAL FLEET RESERVE.—The emoluments of these men will follow the rule in para. 8 above. They will draw rates of pay not less than their present pay plus war retainer of 8d. a day, detained pay, etc. Any higher rate which they may reach in the Air Force will be regarded as including the war retainer, etc. These men will also retain any special rights they may have in respect of pension or gratuity in the Navy, subject to their receiving no alternative compensation in virtue of Air Force service.

10. MISCELLANEOUS ALLOWANCES FOR SPECIAL DUTY (NAVY).—In the case of allowances such as Library, School-master's, Physical Training Instructor's, Charge of Victualling Stores, etc., the Air Ministry reserves the right to vary or withdraw any such allowances, although as far as possible present holders will be permitted to retain them on the lines described in para. 8 above, so long as the individuals actually and necessarily perform the duties for which these allowances are given.

11. REMITTANCES BY POSTAL ORDER (NAVY).—The facilities hitherto given for this will in future be strictly confined to purchases of postal orders on board His Majesty's ships.



*The Olympia Works of the Blackburn  
Aeroplane and Motor Co., Ltd., Leeds.  
Telephone . . . . Roundhay 345.*



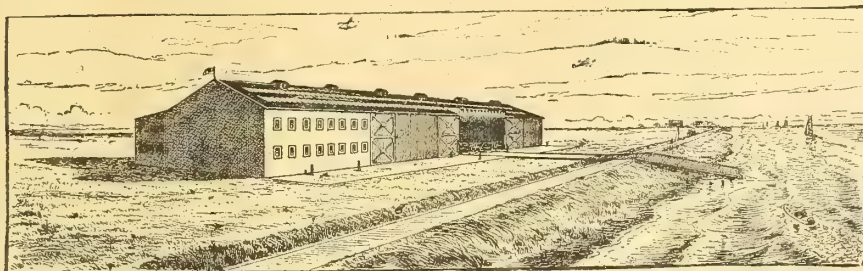
**Pioneers in design  
and construction.**

# **Blackburn**

## **AIRCRAFT**

**“Always at the Front!”**

*A View of the Company's  
Seaplane Sheds at Brough.  
Telephone . . . . Brough 49.*



**The BLACKBURN AEROPLANE & MOTOR CO., Ltd., LEEDS**  
London Office: Donington House, Norfolk St., Strand, W.C. 2.  
Telephone . . . . Central 984.

*Steele's Adv. Serv.*

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



pointments higher than those they now hold, and in which there are at present no vacancies. In these cases they have been graded in the rank corresponding to their present rate of pay and granted honorary rank in the grade they hold before the promotion of the Air Force.

In certain cases the Air Council have made special promotions to meet the needs of the Air Force on its formation.

The list has been compiled by the senior officers of the two Services, and each individual case has been considered, although, in view of the fact that all promotions in the Air Force above the rank of Lieutenant, will be by selection, the exact order of seniority in the different ranks is not of so much importance as in the older Services. It is not improbable that there may be errors in the list, and attention should be drawn to these through the usual channels.

19. All officers (other than those under instruction) who are transferred or attached to the Air Force from the Navy or Army, will, in order to give them authority under the Air Force Act, receive temporary commissions in the Air Force for the period for which they are transferred or attached.

20. In the event of the services of an officer attached to the Air Force proving unsuitable, the Air Council may arrange with the Admiralty or Army Council for his return to his original service.

21. A limited number of permanent commissions in the Regular Air Force will be given to such officers (whether transferred or attached) as apply for, and are selected for, permanent transfer).

#### CONDITIONS APPLICABLE TO SPECIAL CATEGORIES OF OFFICERS.

22. Officers of the following categories, viz. :—

Regular officers.—Navy and Royal Marines;

Officers holding other than temporary commissions in R.N.R. and R.N.V.R.

Regular officers.—Army and Indian Army;

Officers of the Reserve of Officers;

Officers of the Special Reserve of Officers (except Special Reserve, R.F.C.);

Officers of the Territorial Force;

Officers of the Territorial Force Reserve;

Officers attached to the R.N.A.S. or R.F.C. under any special order of the Admiralty or Army Council,

who on the date prescribed by the Order in Council (see para. 1) were attached to the R.N.A.S. or R.F.C., will, subject to their rights under Section 3 of the Act (para. 2), be attached to the Air Force.

23. Officers of the above categories who exercise the right to object to attachment (see para. 2) will revert to naval or military service.

24. Officers of the following categories, viz.,

Officers holding temporary commissions in the Royal Marines, R.N.V.R., R.N.R., and R.N.A.S.;

Temporary officers on the General List of the Army and Indian Army;

Officers of the Indian Army Reserve;

Officers of the Special Reserve of the Royal Flying Corps;

Officers attached to the R.N.A.S. or R.F.C. under any special order of the Admiralty or Army Council,

who on the date prescribed by the Order in Council (see para. 1) belonged to or were attached to the R.N.A.S. or R.F.C. will, subject to their rights under Section 3. of the Act, be transferred to the Air Force.

25. Temporary R.N.V.R., R.N.R. and R.N.A.S. officers who have not served with a commission in any branch of the Royal Navy except the R.N.A.S., will, if they refuse to be transferred to the Air Force, have no claim to be accepted by the Admiralty as commissioned officers in another branch of the Navy.

26. An officer of the R.F.C. Special Reserve who refuses to be transferred to the Air Force will have no military unit to which

#### APPENDIX IIb—RE-MUSTERING OF R.N.A.S.

Personnel of Royal Naval Air Service, rated as	Will be re-mustered in the Air Force as —			Personnel of Royal Naval Air Service, rated as:—	Will be re-mustered in the Air Force as:—		
	Technical.	Non-Technical.	Clerks and Storemen.		Technical.	Non-Technical.	Clerks and Storemen.
Chief petty officer, 1st Grade—				Engineer—			
All except (G) ratings	Chief master mechanic.	Serjeant-major, Class I.		Fitter ... ..	Fitter Aero engine, General, Mechanical transport, Jig and tool maker		
(G) ratings ... ..				Turner ... ..	Turner		
Chief petty officer, 2nd Grade—				Sheet metal worker...	Tinsmith and sheet metal worker		
All except (G), writer and stores ratings	Master mechanic			Welder ... ..	Acetylene welder		
(G) ratings ... ..		Serjeant-major, Class II.	Master clerk.	Coppersmith ... ..	Coppersmith		
Writers and stores ...				Blacksmith ... ..	Blacksmith		
Chief petty officer, 3rd Grade—				Instrument maker ...	Instrument repairer		
All except (G), writer and stores ratings.	Chief mechanic.			Tool maker ... ..	Fitter—Jig and tool maker		
(G) ratings ... ..		Flight serjeant	Flight clerk.	Electrical—			
Writers and stores ...				Wireman ... ..	Electrician		
Petty officer—				Instrument maker and repairer	Instrument repairer		
All except (G), writer and stores ratings.	Serjeant mechanic			Powerhouse mechanic	Electrician		
(G) ratings ... ..		Serjeant.	Serjeant clerk.	Driver—			
Writers and stores ...				S.D.			
Leading rating—				Petrol driver	Driver—Petrol	Motor cyclist	
All except (G), writer and stores ratings.	Corporal mechanic.			Steam wagon driver	Driver—Steam		
(G) ratings ... ..		Corporal	Corporal clerk.	Armourer ... ..	Armourer		
Writers and stores ...				Carpenter ... ..	Carpenter		
Air mechanic, 1st Class—				Rigger (heavier than air)	Rigger (aeroplane).		
All except (G), writer and stores ratings.	Air mechanic, 1st Class			Rigger (lighter than air)	Rigger (airship)		
(G) ratings ... ..		Private, 1st Class.	Clerk, 1st Class	Stores ... ..			Storeman
Writers and stores ...				Writer ... ..			Clerk General, Pay, Short-hand-typist, Stores.
Acting air mechanic, 1st class—							
All except (G), writer and stores ratings.	Air mechanic, 2nd Class			Photographer ... ..	Photographer		
(G) ratings ... ..		Private, 1st Class	Clerk, 1st Class	Draughtsman ... ..	Draughtsman		
Writers and stores ...				Fabric worker ... ..		Fabric worker	
Air mechanic, 2nd Class—							
All except (G), writer and stores ratings.	Air mechanic, 3rd Class			Motor boats—			
(G) ratings ... ..		Private, 2nd Class	Clerk, 2nd Class	Engineers ... ..	Driver—Motor boat.		
Chief petty officer—Air- craftman.		Flight serjeant	Flight clerk	Coxswains ... ..	Motor boat coxswains		
Petty officer—Aircraft- man		Serjeant ... ..	Serjeant clerk.	Hydrogen worker—			
Leading aircraftman ...		Corporal ... ..	Corporal clerk.	Water gas, silicon	Hydrogen worker		
				General ... ..		Labourer, &c., accord- ing to employment.	Clerk—General
Aircraftman, 1st Grade...				Meteorological ... ..			
" 2nd Grade...		Private, 1st Class ...	Clerk, 2nd Class.	Aircraft Branch—			
Officers, stewards and cooks, 1st Class.		Private, 2nd Class ...	Clerk, 3rd Class	Aircraftman ... ..		Labourer, &c., accord- ing to employment	Clerk General, pay, short hand-typist Stores.
Officers, stewards and cooks, 2nd Class		Corporal ... ..		" writer ... ..			Storeman.
Officers, stewards and cooks, 3rd class.		Private, 1st class		" victualling ... ..			
		Private, 2nd Class.		" gunlayer ... ..		Aerial gunner	Storeman.
Boy ... ..	Boy	Boy	Boy clerk.	" stores ... ..		Labourer.	
Mechanic branch—				" motor boat...			
Gunlayer ... ..		Aerial gunner.		Officers' Stewards and Cooks—			
Wireless telegraph ...	Wireless operator			Officers' steward ...			
				cook ... ..		Batman Cook.	



# WESTLAND *Aircraft.*

WESTLAND AIRCRAFT WORKS.

BRANCH OF PETTERS LTD.,

YEOVIL.

*Phone, Yeovil 141. Telegram Aircraft Yeovil.*





he can be re-appointed, and will have no claim on the Army Council for appointment to commissioned rank in another branch of the Service.

27. Temporary officers on the General List of the Army who have not served while holding a commission in any branch of the Army except the R.F.C. will, if they refuse to be transferred to the Air Force, have no claim to be accepted by the Army Council as commissioned officers in another branch of the Army. CONDITIONS APPLICABLE TO ALL RANKS OTHER THAN OFFICERS.

28. All warrant officers, chief petty officers, petty officers, air mechanics, aircraftmen, and other ratings who, on the date prescribed by the Order in Council (see para. 1) belong to or

are attached to the R.N.A.S., and all warrant officers, non-commissioned officers, men and boys who, on the same date, belong to or are attached to the R.F.C., will be transferred to the Air Force, with effect from the date to be fixed by the Order of the Air Council referred to in para. 3.

Royal Fleet Reserve ratings will be attached only.

29. The rank of those transferred to the Air Force under the preceding paragraph will not be lower than the corresponding rank in the Navy and Army held on the day preceding transfer. These ranks are set out in Appendices IIb and IIc.

AIR MINISTRY,

March 1st, 1918.

#### APPENDIX IIc—RE-MUSTERING OF R.F.C.

Men in the Royal Flying Corps mustered as—	Will be re-mustered in the Air Force as—			Men in the Royal Flying Corps mustered as—	Will be re-mustered in the Air Force as—		
	Technical.	Non-Technical.	Clerks and Storemen.		Technical.	Non-Technical.	Clerks and Storemen.
Warrant officer—				Summary—			
Technical ...	Chief master mechanic			Aerial gunner ...	—	Aerial gunner.	
Disciplinary ...	—	Sergeant-major, Class I.	Master clerk.	Armourer ...	Armourer	Assistant armourer	
Superintending clerk ...	—	—		Assistant armourer ...	—	—	
Quartermaster-sergeant—				Instrument repairer ...	Instrument repairer	Instrument repairer	
Technical ...	Master mechanic			Watchmaker ...	—	—	
Non-technical ...	—	Sergeant-major, Class II.		Miscellaneous—			
Flight-sergeant ...	Chief mechanic	Flight sergeant according to mustered trade.	Flight clerk	Disciplinary ...	—	Disciplinarian	
				Labour ...	—	Labourer	
Sergeant ...	Sergeant mechanic	Sergeant according to mustered trade	Sergeant clerk	Shoemaker ...	—	Shoemaker	
				Tailor ...	—	Tailor	
				Others (a) ...	Miscellaneous	—	
Corporal and air mechanic.	Corporal mechanic	Corporal	Corporal clerk.	Painter ...	Painter.	Painter's mate	
	Air mechanic, 1st Class.	Private, 1st Class.	Clerk 1st Class.	Photographer ...	Photographer	—	
	Air mechanic, 2nd Class.	Private, 2nd Class.	Clerk, 2nd Class.	Camera repairer ...	Camera repairer	—	
	Air mechanic, 3rd Class.	—	Clerk, 3rd Class.	Rigger ...	Rigger (aeroplane) or Rigger (airship).	—	
	According to mustered trade as set out hereunder			Sailmaker ...	—	Fabric worker	
Acetylene welder ...	Acetylene welder.			Upholsterer ...	Upholsterer	—	Storeman.
Batman ...	—	Batman.		Storeman ...	—	—	
Blacksmith ...	Blacksmith.	Blacksmith's striker		Telephonist ...	K.B. telephonist	Telephone operator.	
Carpenter ...	Carpenter.	—		Tinsmith Sheet metal worker	Tinsmith and sheet metal worker	—	
Carpenter (carriage body builder).	Motor body builder.	—		Vulcaniser ...	Vulcaniser	—	
Carpenter (pattern maker)	Pattern maker	—		Wireless operator ...	Wireless operator.	—	
Clerks—				K.B.S. balloon party	Wireless mechanic.	Labourer	
General ...	—		Clerk, General.	K.B.S. balloon rigger	Rigger, airship.	—	
Ledger ...	—		Clerk, Stores.	K.B.S. silical plant	Hydrogen worker.	—	
Pay ...	—		Clerk, Pay.	K.B.S. winch driver and fitter.	Winch driver and fitter	—	
Stores ...	—		Clerk, Stores.				
Tally card ...	—		Clerk, Stores.	(a) Included here are—			
Cook ...	—	Cook.		Miscellaneous—			
Coppersmith ...	Coppersmith.	—		Aviator ...	Pilot.	—	
Coppersmith's mate ...	—	Coppersmith's mate.		Packer ...	Packer	Packer's mate.	
Cyclist, motor ...	—	Motor cyclist.		Various instructors ...	Instructor	—	
Draughtsman ...	Draughtsman.	—		A.I.D. examiner ...	—	—	
Driver, M.T. ...	Driver—	—		Civilian flying school employee).	—	—	
	Motor boat.	—		Compositor ...	—	—	
	Petrol or steam.	—		Printer ...	—	—	
Electrician ...	Electrician.	—		Lithographer ...	—	—	
Magneto repairer ...	Magneto repairer	—		Men employed as—	Will be re-mustered as—		
Fitter—	Fitter—			Jig and tool makers	Fitter jig and tool maker	—	
Engine erector, M.T. ...	Mechanical transport.			Propeller repairer ...	Propeller maker	—	
Engine ...	Aero engine.			N.C.O. observer ...	Observer	Butcher.	
General ...	General.			Butcher ...	—	—	
Motor cycle ...	Mechanical transport.						
M.T. ...	Mechanical transport.						
Machinist ...	Machinist.						
Millwright ...	Millwright.						
Moulder ...	Moulder.						
Turner ...	Turner.						

† Storemen who are employed as labourers only will be graded as Private, Class 2.

† Air mechanics in the R.F.C., Class III., become Privates, 2nd Class, or clerk, 3rd Class; Air mechanics, Class II., become Air mechanics, 2nd and 3rd Class, or as re-graded privates or clerk's, subject as regards new to the note in heavy type on page 10.

#### APPENDIX II.D.—TRADE CLASSIFICATIONS IN AIR FORCE.

Technical.	Non-Technical.	Clerks and Storemen.	Technical.
Chief master mechanic.	Sergeant-major, Class I.	Master clerk.	Hydrogen worker.
Master mechanic.	Sergeant-major, Class II.	Flight clerk.	Instructor (to be described).
Chief mechanic.	Flight-sergeant.	Sergeant clerk.	Instrument repairer.
Sergeant mechanic.	Sergeant.		K.B. telephonist.
			Magneto repairer.
			Millwrights.
			* Miscellaneous.
Corporal Mechanics and Mechanics.	Corporals and Privates.	Corporal Clerks and Clerks.	Motor-body builder.
Acetylene welder.	Aerial gunner.		Motor-boat coxswain.
Armourer.	Assistant armourer.		Moulders.
Blacksmith.	Batman.		Observer.
Boat builder.	Butcher.		Packer.
Camera repairer.	Cook.		Painter.
Carpenter.	Coppersmith's mate.		Pattern maker.
Coppersmith.	Disciplinarian.		
Draughtsman.	Fabric worker.		
Driver—	Hospital orderly.		
Motor-boat.	Labour.		
Petrol.	Packer's mate.		
Steam.	Painter's mate.		
Electrician.	Motor-cyclist.		
Fitter: Aero engine, general mechanical transport, jig and tool makers.	Shoemaker.		
	Tailor.		
	Telephone operator.		

All learners will be entered in the "Non-technical" category and be re-mustered to the "Technical" category when sufficiently qualified to be able to pass the prescribed examination.

\* Mechanics mustered under this head, to be restricted to a minimum.  
† Storehandlers (i.e., storemen employed as labourers only) will be (non-technical) privates.



# ROLLS-ROYCE

Contractors to H.M. Government.

## Rolls-Royce Aircraft Engines

LIKE

## Rolls-Royce Cars

ARE

## The Best in the World.

A British Battle Plane weighing six tons which flew from London to Constantinople, 2,000 miles in 30 hours of Flight, was equipped with Roll-Royce Aero Engines.

THE USE OF  
THIS BADGE



is an indication  
that this Firm  
has been accept-  
ed as genuinely  
British by a Tri-  
bunal of Trade  
Competitors

ROLLS-ROYCE, Limited, 14 & 15, Conduit St., London, W.1.

Telegrams: Rolhead Reg., London. Telephone: 1654 Gerrard (3 lines).

AND AT

DERBY, PARIS, NEW YORK, MADRID, BOMBAY, ETC.



## APPENDIX III.

## ALLOWANCES.

The following examples and notes are given as typical of the ordinary Army allowances for officers and men at the present time, issuable, as a rule, when provision cannot be made in kind. They do not profess to give more than examples, and it is impossible within the limits of this pamphlet to set forth the administrative regulations governing their issue.

## A.—OFFICERS.

## 1. Typical ordinary rates (daily):—

	Lodging.	Fuel and Light.		Field Allowance (when on field duty).*	Ration Allowance.	Forage and Stable Allowance.	Servant Allowance.
		Winter.	Summer.				
Colonel (Class 6) ...	4s. 6d.	1s. 11d.	11d.	4s. 6d.	1s. 9d.	1s. 9d.	
Regimental Lieut.-Colonel (Class 8).	4s.	1s. 7d.	9d.	4s.	1s. 9d.	1s. 9d.	
Regimental Major (Class 10).	3s.	1s. 1d.	7d.	4s.	1s. 9d.	1s. 9d.	
Regimental Captain (Class 12).	2s. 3d.	7d.	4d.	3s.	1s. 9d.	1s. 9d.	
Regimental Lieutenant (Class 14).	2s.	7d.	4d.	2s. 6d.	1s. 9d.	1s. 9d.	

\* Not issuable with lodging money in the United Kingdom.

2. The rates vary at foreign stations, and at some stations abroad Colonial allowance is also given.

3. Officers on regimental pay serving with Army Expeditionary Forces on land draw a special money allowance, as an additional war emolument, in the form of the allowances for lodging, fuel and light appertaining to their rank. For example, a captain serving in France will ordinarily be accommodated by the public and draw a ration in kind, and will in addition draw field allowance and lodging, fuel and light allowances at the above rates, class 12.

4. Children's allowance:—

(a) Higher rate, at £2 a month, up to a maximum of four children:—

Staff officers whose rate of pay when quarters are not allotted does not exceed £400 a year consolidated.

Officers of the Administrative Branch up to and including the rank of captain.

Officers of the Technical Branch of the rank of second lieutenant.

(b) Lower rate, at £1 a month.

Staff officers whose rate of pay when quarters are not allotted exceeds £400 but does not exceed £500 a year consolidated.

Officers of the Administrative Branch of the rank of major.

Officers of the Technical Branch of the rank of lieutenant or captain.

Flying officers up to rank of lieutenant.

The entitlement is more fully defined in the Army and Admiralty Orders already published (A.O. 44 of 1918; and Admiralty Order 342, R. 304/18, dated 1.3.18).

If a first claim has already been made to the Admiralty or War Office, no further claim will require to be made to the Air Ministry. First claims should continue to be sent to these other departments up to the date referred to in para. 1 of this pamphlet, and thereafter to the Air Ministry. Formal instructions on this will be issued later.

5. Officers drawing the higher rate of children's allowance previous to transfer who come into a rank or appointment in the Air Force which does not admit of the higher rate, will draw such addition to the lower rate of children's allowances as will ensure that the pay and children's allowance in the Air Force are together not less than the pay and children's allowance hitherto drawn.

6. In any cases in which the increase of pay (say, 2s. a day) on promotion from a rank entitling an officer to the higher children's allowance to a rank entitling him only to the lower rate, is more than offset by the reduction in the allowance (say, 2s. 8d.), the deficiency (8d.) can be issued as additional children's allowance (making in this case children's allowance of 3s. 4d. in all).

7. Instructions will shortly be issued prescribing the mode of claiming allowances and providing for the amounts due to be credited each month to the officer through his Agent.

## B.—WARRANT OFFICERS, N.C.Os. AND MEN.

## 5 Typical ordinary rates (daily):—

Rank	Classification in Army Allowance Regulations.	Lodging.*	Fuel and Light.*		Field Allowance (when on field duty).	Ration Allowance.	Married Establishment† (Peace Regulations).	Separation Allowance.
			Winter.	Summer				
Warrant officers, Cl. I.	15	1s. 6d.	11d.	6d.	1s.	1s. 9d.	Per cent. 100	
Warrant officers, Cl. II.	16	1s. 4d.	8d.	4d.	6d.	1s. 9d.	100	
Flight serjeants and serjeants.	19	9d.†	—	—	—	1s. 9d.	50	See below, para. 9.
Corporals and privates	20		—	—	—	1s. 9d.	4	

\* Mostly in abeyance during the war, in view of billeting, &c., and see para. 6 below.

† Practically in abeyance during the war, as separation allowance is issuable without restriction.

‡ To include fuel and light.

6. The above rates of lodging, fuel and light allowances are for single men or for married men separated from their families. When married men are living with their families, a consolidated family allowance based on separation allowance is issuable.

7. Clothing: a free initial kit, with subsequent necessary maintenance is given during the war. A money allowance is given in peace for renewals and upkeep. The system of quarterly kit upkeep allowance in the R.N.A.S. will cease.

8. Field Allowance: the field allowance hitherto issued to Naval personnel will cease, and will be replaced by the field allowance in para. 5 above in so far as this is issuable: the issue in para. 5 is confined to Warrant Officers.

9. SEPARATION ALLOWANCE.—(1) WIVES AND CHILDREN.—The Army rates (weekly) for a wife and children are as follows:—

Under certain conditions the above rates are increased by 3s. 6d. a week in the case of wives resident in the London postal area. ["Above rates" refers to the table below.—Ed.]

The above rates are in respect of children under 14.

The rates for children over 14 are less.

The weekly rates for motherless children are as follows:—

Under 14 years.—For each child, if each is in the care of a separate guardian, 7s. Where two or more children of the same family are in the care of one guardian, 7s. for the first and 6s. for each other child.

Over 14 years.—For each entitled child, 5s. Where an allotment from the man's pay in respect of motherless children was actually in payment, or authorised by the man on or before the 2nd December, 1917, the allowance

	Wife only	Wife and 1 child.	Wife and 2 children.	Wife and 3 children.	Wife and 4 children.	Wife and 5 children.	Wife and 6 children.	Wife and 7 children.	
Private and corporal	12s. 6d.	19s. 6d.	24s. 6d.	28s.	31s.	34s.	37s.	40s.	With 3s. for each additional child under 14 years.
Serjeant (including flight serjeant.	15s.	22s.	27s.	30s. 6d.	33s. 6d.	36s. 6d.	39s. 6d.	42s. 6d.	
Warrant officer, Class II	22s.	27s.	30s. 6d.	32s. 6d.	34s. 6d.	36s. 6d.	39s. 6d.	42s. 6d.	
Warrant officer, Class I	23s.	28s.	31s. 6d.	33s. 6d.	35s. 6d.	37s. 6d.	39s. 6d.	42s. 6d.	

Note.—These rates include the amounts, 3s. 6d. and 5s. 10d. according to rank formerly allotted by the man from his pay (Army).



THE BRITISH & COLONIAL  
AEROPLANE CO., LIMITED

— FILTON, BRISTOL —

CONSTRUCTORS OF

*The "Bristol" Aeroplanes.*

— CONTRACTORS TO —  
H.M. AIR FORCES.

Telegrams:  
"AVIATION, BRISTOL."



Telephones:  
3906 BRISTOL  
(Private Branch Exchange)



as stated above will be increased by the amount of the allotment (3s. 6d. or 5s. 10d.). This concession is applicable to the Army only. Allotments made subsequent to that date must be borne by the man.

(2) **OTHER DEPENDANTS.**—The Army rates for dependants other than wives and children are assessed as follows:—In the case of dependants to whom the soldier was bound by some natural tie, and who are found as a fact to have been wholly or partly dependent on the soldier before his enlistment, the amount which the soldier used to pay for the support of the dependant is ascertained and paid as dependant's separation allowance. The amount is subject to certain upper limits corresponding approximately to the rates for a wife and children. Fuller particulars as to the conditions of entitlement, etc., can usually be had from Post Office leaflets or from local War Pensions Committees, the addresses of which can be got from the Post Office.

(3) **ADJUSTMENTS ON TRANSFER TO THE AIR FORCE.**—There will be no change in the allowances of men coming over from the Army, except in so far as individuals may be promoted, on transfer, to a rank in the Air Force carrying a higher rate.

In the case of men coming from the Navy, the benefit of Army rates and conditions will be given when they are more favourable than those of the Navy. The allowances will be adjusted to Army rates and conditions as follows:—

(a) **ALLOWANCES FOR WIVES AND CHILDREN.**—The Army rates are more beneficial and in the ordinary cases will be paid in full from public funds without any contribution from the man's pay. If, owing to a voluntary allotment being made by the man, the amount now being paid to the wife (as combined separation allowance and allotment) is greater than the Army scale of separation allowance would give the excess over the Army rate will continue to be issued as a voluntary allotment and will be charged against the man's account, unless and until he notifies his desire to the contrary. For example, take the case of a leading mechanic with a wife and two children. The weekly issue has hitherto been 21s. 6d., towards which the man contributed 1s. 6d. from his pay. In future the weekly payment will be 24s. 6d., without any contribution from the man. If the man has been making an additional voluntary allotment, so as to make the total weekly issue, say, 30s., 24s. 6d. of this will be paid by the State, and the balance of 5s. 6d. only will be charged against the man's account.

(b) **ALLOWANCES FOR DEPENDANTS.**—The amounts due on the Army system of assessment, as described in (2) above, will be ascertained and will become payable in full without any contribution by the man.

If the amount now being received by the department is less than the Army scale would give, the Army rate will be issued and no charge will be made against the man's account. For example, take the case of a man whose dependant is now getting 12s. a week, 2s. 6d. of which is being contributed from the man's pay. If the Army regulations would allow 16s., the full 16s. will be issued without any contribution at all by the man.

If the amount now being received by the dependant is greater than the Army scale would give, the full amount as hitherto will continue to be issued to the dependant (unless and until the man notifies his desire to the contrary), but the share of this charged against the man's account may be less. For example, take the case of a man whose dependant has been receiving 14s. a week (that being the pre-war dependence), 4s. 6d. of which was charged against the man's account. If the amount due under Army rules is 12s. 6d., 14s. will continue to be issued to the dependant, but only 1s. 6d. of it will be charged against the man. Take, again, the case of a man whose dependant has been receiving 16s., 5s. 6d. of which was charged against the man's account but whose dependence allowance under Army rules turns out to be only 10s. 6d., i.e., the amount of the pre-war dependence. In that case 16s. will continue to be issued; 10s. 6d. will continue to be borne by public funds as hitherto, and 5s. 6d. will be charged against the man's account.

Thus in many cases there will be a clear gain to the man or to his family or dependants, and in no case will the amount paid from public funds by the Air Ministry be less than the amount which they are now entitled to be paid from public funds by the Admiralty or War Office.

It should be clearly understood that the re-assessment of separation allowance, in cases where any increased benefit is due, will take some considerable time. Until the rate has been re-assessed the issue will continue as at present. When the new rate has been fixed the increased benefit (if any) will take effect for the future, and the arrears (if any) will be made good to the man or his wife or dependant.

## TO THE AIR FORCE.

Fitful fires of inspiration

Flickered feebly in the past

Till the sudden flame of reason

Rose triumphantly at least,

Proved itself, compelled acceptance

Of the phantasy of flight,

Stirring throughout all the ages

Dreamers who had dreamed aright.

Set your seal on past endeavour,

Take the future for your care,

For perchance the fate of nations

Waits the verdict of the air.

May the God of Battles keep you

Ever worthy of your trust;

Rally to your new allegiance,

Raise traditions out of dust! H. T.

## THE AIR FORCE MEDICAL COMMITTEE.

The Medical Administrative Committee to which Major Baird, Under-Secretary to the Air Ministry, referred in his statement on the introduction of the Air Force Estimates has now been appointed.

According to the "Lancet," the Director-General of the Naval Medical Service is chairman, and the other members are the Director-General of the Army Medical Service, Fleet Surgeon R. C. Munday (Medical Administrator), Major C. B. Heald (Assistant Medical Administrator), Surgeon-General Rolleston, Dr. Henry Head, Mr. Raymond Johnson, Dr. Leonard Hill, and Sir Walter Fletcher, the secretary of the Medical Research Committee.

## THE AIR FORCE MEDICAL SERVICE.

Surgeon Graeme-Anderson, R.N., addressing the London Medical Society on March 11th, said that an aviator's life consisted of spells of idleness punctuated with moments of intense fear. The Germans, until recently, selected aviators from the cavalry. The ideal age was twenty-four. Most men smoked a great deal and there were few teetotalers. He had seen one man under the influence of drink do some wonderful "stunts," but his passenger was violently sick. Little "nips" in the air were not desirable, as the action of alcohol was intensified in the higher atmosphere.

[Unfortunately lack of time and space prevents one from dealing with this very interesting lecture at length, but one hopes to return to the subject frequently in the future.—Ed.]

## A MATTER OF BUSINESS.

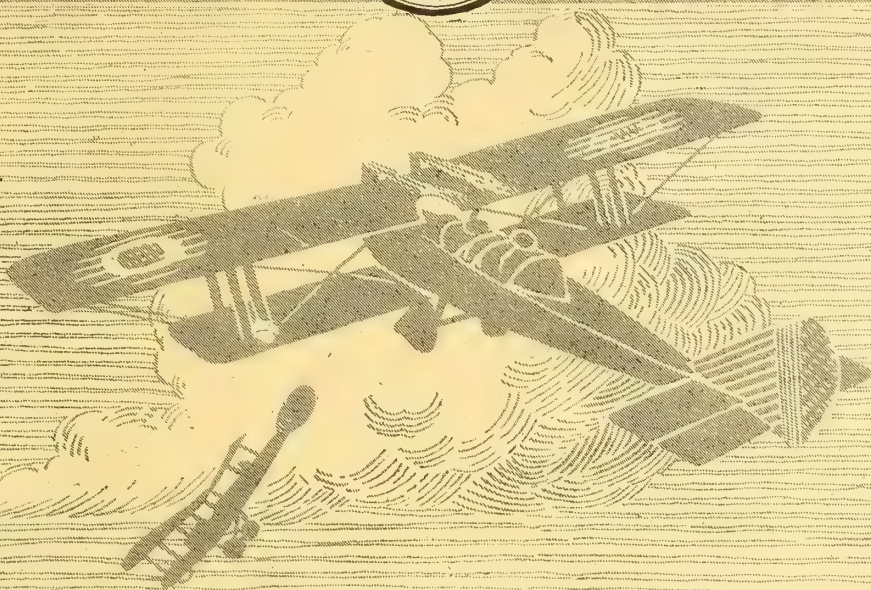
The past week has been notable in London for the prominent part played by aviation in connection with the so-called "Business Man's" War Loan Campaign. The application of business methods was not particularly obtrusive; in fact, one rather obtained the impression that the affair was being run by an agglomeration of advertising agents and cinematograph impresarios. The welter of tanks, aeroplanes, airship cars, imitation Zeppelins, "battleplanes" (beloved of Fleet Street), kite-balloons, Blimps, Astras, and so forth which reposed in or cavorted around and above Trafalgar Square was enough to produce an aero-mechanical nightmare. But it was not business.

One particularly evident feature of the terrestrial museum was the imposing S.I.A. biplane—which, of course, the news-sheets called a Caproni, that being their only Italian word—on which Capt. Laureati flew to London. Now, one admires the S.I.A. biplane, and one likes Capt. Laureati immensely, but one would very much like to know why an aeroplane built by our gallant Allies was chosen to demonstrate to all and sundry our aerial strength.

Improbable though it may seem to English business men—who are by nature hucksters and not producers—and impossible though it may seem to our Government officials, there are, in fact, British aeroplanes, purely indigenous products, which are quite the equal of anything built abroad. And to the ordinary intelligence it would seem that this was, above all others, the occasion on which to demonstrate to Londoners the excellence of British products.

It is a curious thing that the drafters of official announcements and the proprietors of British newspapers alike seem to have entered into an agreement to boom foreign aeronautical manufactures and to hide British efforts. The British Public, and the public of foreign countries where we hope to do business after the war, know of Gothas, Capronis, Albatroses, Aviatiks, Sias, Nieuports, Curtisses, Bleriot's, Farmans, and, among engines, Liberties, Gnômes, Mercédès, and so forth. But, who outside readers of the technical press ever hears of Sopwith's, Martinsydes, Bristols, Handley Pages, de Havillands, or of Rolls-Royces, Sunbeams, B.H.P.s., or A.B.C.s., among aero-engines? It seems time for our numerous officials of propaganda to sit up and take notice.



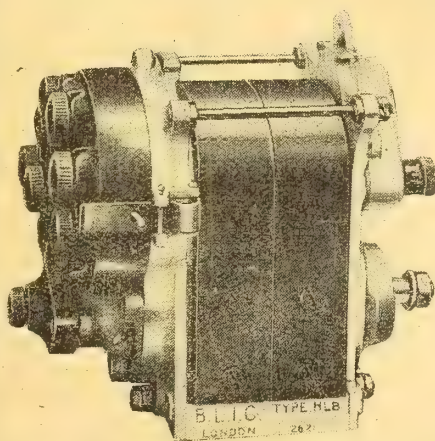


THE HEART OF THE AEROPLANE—  
the vital centre of its power unit—is undoubtedly  
the magneto. Failure there must be unthinkable!   
That is why the "B.L.I.C." Magneto is supreme—  
its absolute reliability may be taken for granted!

# B.L.I.C.

THE BRITISH LIGHTING & IGNITION CO. LTD.

THE BRITISH  
LIGHTING AND  
IGNITION Co., Ltd.



204, Tottenham Court  
Road, London, W. 1.  
Proprietors: VICKERS Ltd.



### ACADEMIC HINDRANCES.

When one finds oneself under the unpleasant necessity of criticising people concerned with the output of aircraft in these days, one is consoled by the certainty that those at the head of affairs are doing their utmost to increase the quantity and quality of our aeroplanes, and will rather welcome criticism so long as it is directed in the right direction. One therefore takes the liberty of pointing out that there is room, considerable room, for improvement in the methods of those subordinate officials who are responsible for experimenting with new aeroplanes.

The term official is used advisedly, for, although the official experimental pilots are men who have seen active service, the heads of certain sections are merely civilians in uniform. Being, as they are, under the Technical Department of the Air Council, there is still less excuse for their adopting the methods, and, incidentally, the manners, of Prussian militarism, than if they were serving on the militant side of the Air Force. As a matter of fact, if they were soldiers in reality, there would not be the slightest chance of their behaving as appears to have become their habit of late. Being a convinced militarist oneself, one is the more insistent that those who have the honour of wearing the King's uniform should be worthy of it. It appears, therefore, unseemly that civilians holding temporary commissions should, in their behaviour to ununiformed civilians who are doing their best to win the war, be commonly reported as contrasting very unfavourably with the officers and gentlemen of the regular Army.

It is common knowledge that new types of aeroplanes produced by various firms are constantly being passed through the chief experimental station for test. Time was when the designers and pilots of the producing firms welcomed the opportunity of visiting that station, where they were assured of solidly courtesy and every assistance. For some strange reason, things seem to have changed remarkably of late, and it would be well if the higher authorities investigated the cause, for the present methods seem likely to prejudice seriously the production of new and improved aeroplanes for the Air Force.

When the first example of a new type of machine has been rushed through against time, the designer, or the firm's representative—whichever he may be—should be encouraged to get the best possible performance out of it. He, his pilot, and his mechanics should, as a matter of principle, put the machine together, tune it up, and test it before handing it over to the official test pilots. It is bad policy to hustle them over their work, it is absurd to expect an experimental machine or engine to be perfect at the first attempt, and it is ungentlemanly to order the firm's employees about as if they were infantry conscripts.

One hears of a case in which a machine arrived with its crew after a long journey by road, the men having worked at it all night for several nights previously. The men were dog-tired, but they did their best to get it together during the ensuing night, living the while on what food civilians can scratch together when away from home. One gathers that, because they did not work next day as smartly as well-rested and fed R.F.C. mechanics, they were turned out of the aerodrome by some exalted official, and the machine was assembled and put in some sort of flying order by the staff of the station. Such treatment is distinctly liable to cause serious discontent among a particularly loyal and enthusiastic section of aircraft workers, namely, the picked erectors and tuners of the designing firms.

Further, one hears that when the firm's representative, as a relief for his tired nerves, was quietly smoking a cigarette out in the aerodrome he was peremptorily ordered not to smoke. This, be it noted, was despite the fact that the officials of the station smoke when and where they please. One suggests that the responsible representative of a considerable firm is at least entitled to common courtesy. Certainly any former member of the motor-cycle trade who happens to be in uniform for the time being should, in the light of commercial experience, appreciate the value of courtesy in business.

It is submitted that, in the best interests of the Air Force, designing firms should be entitled to handle their machines themselves until their best performance has been duly registered, and the firm itself has signified that it can do no better. Then, and not till then, should the machine be turned over to the experimental staff, for them to carry out their quaint ideas on it. Under the present methods weeks and months are wasted in purely academic experiments before the ultimate performance of a machine is ascertained. Meantime the active service people are crying out constantly for newer and better aeroplanes with which to maintain or increase their ascendancy over the enemy.

The actual war performance of a machine can be ascertained in a few days in any kind of weather by comparative tests against existing war machines. On that performance the machine can be ordered in series or condemned as useless.

After that, if it pleases a number of able-bodied men to spend their time on purely academic tests, and if the National Service Ministry does not object to their so doing, then by all means let

them have the sample machine to hack about, to see if they can improve it.

The academic mind doubtless has its uses. Possibly university professors can be made to fulfil some good purpose in war-time. But the academic mind cannot be permitted to prevent practical people from getting on with the war. One has had much experience of the professorial type. Its manners are not frequently pleasant. Its practical common sense is not superlatively obtrusive. One has not met it in uniform, but one can believe that the methods of the school-room and the lecture-hall, when camouflaged to resemble what the individual believes to be a military manner, may take on a distinct flavour of Prussianism. In its own place the "Herr Professor" type may be useful, but among practical producers of war aeroplanes it is not helpful.

C. G. G.

### THE NEW CHIEF OF THE R.A.F.

The Secretary of the Air Ministry announces that Mr. Sydney Smith has been appointed Superintendent of the Royal Aircraft Factory, Farnborough.

Mr. Sydney Smith was formerly Chief Inspector of Factories under the Home Office, and, in consequence, has had wide and varied experience of factory organisations and of the habits of employees in workshops.

### WAR LOAN.

Among the depositors at the Trafalgar Square Tank Bank was the Aeronautical Society of Great Britain, which paid in £100. Thus is the premier Scientific Aeronautical Society of the world identified, as usual, with the cause of patriotism. It is a creditable performance for a Society which has so many urgent demands on its funds.

### FOR A GOOD OBJECT.

The attention of readers is drawn to the following advertisement:—

### COLISEUM, CHARING CROSS. ROYAL FLYING CORPS CONCERT.

To provide Funds for the Equipment of a Seaside Convalescent Home in connection with the Royal Flying Corps Hospitals at Eaton Square and Bryanston Square, W. The casualties in the Royal Flying Corps are heavy and serious, but this is no deterrent to the men who unhesitatingly go out and encounter the greatest risks of modern warfare.

SUNDAY, MARCH 17, 1918, at 3 p.m.

Preliminary List of Artists who have already promised to appear by kind permission of their respective Managements:—

GEORGE BAKER.  
LOIE BARKER.  
DONALD CALTHROP.  
BESSIE CLIFFORD.  
MARGARET COOPER.  
CORAM.  
MURRAY DAVEY.  
LOU EDWARDS.  
REGINE FLORY.  
THE GRESHAM  
SINGERS.  
VIVIAN FOSTER.  
RENEE KELLY.  
KYASHT.

VIOLET LORAIN.  
AUSTEN MELFORD.  
MELSA.  
MARIE NOVELLO.  
JAN OY-RA.  
COURTICE POUNDS.  
ROBERT RADFORD.  
MADGE SAUNDERS.  
ELLA SHIELDS.  
STRALIA.  
LEO STROCKOFF.  
PERCY TARLING.  
ALBERT WHELAN.  
FLORA WOODMAN.

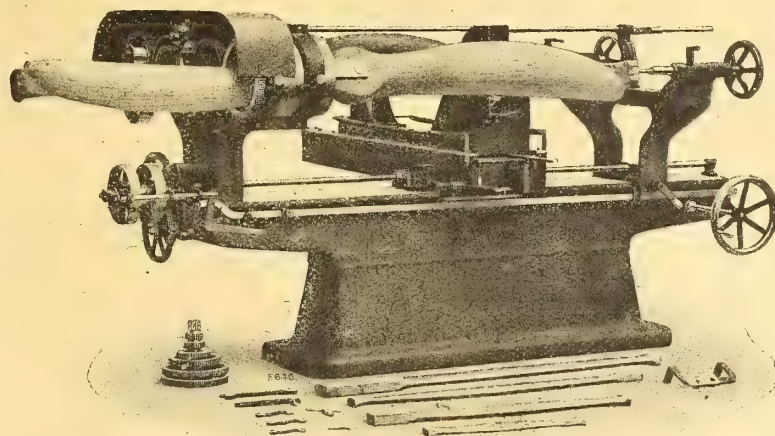
Prices: BOXES by Arrangement; FAUTEUILS, 21s. (Tax 3s.), 10s. 6d. (Tax 1s. 6d.); BALCONY STALLS, 10s. 6d. (Tax 1s. 6d.), 7s. 6d. (Tax 1s.), 4s. (Tax 9d.); GRAND TIER, 5s. (Tax 9d.), 3s. (Tax 6d.); BALCONY, 1s. 6d. (Tax 4d.), of all libraries and

COLISEUM.

Advance  
Booking  
Office.  
Tel., Ger. 7541.

It is hoped that all who can possibly do so will attend this performance. Never was there a more worthy object for a charity show. The Air Force Medical Service is more than ever to the fore at the moment. It is eminently desirable that when it comes into being it should have at its disposal hospitals as well equipped as is humanly possible. Already Dr. Swan's efforts at Bryanston Square and Eaton Square have had magnificent results, and have done much to ameliorate the lot of those who have done so gallantly in the air and have suffered injury in consequence. One therefore appeals to all who are concerned in any way with aviation to support this performance on Sunday next.





## THE MANUFACTURE OF PROPELLERS.

ALL who have seen propellers being carved out by hand will have realised the need of a machine for this work.

The Defiance Patent Propeller Forming Machine dispenses with all hand work except the final finishing operation. It will reduce the total time of production 50 per cent.

The machine works on the copying principle; the model rotating in the back centres while the blank is turned in the front centres. A roller moving over the surface of the model gives the necessary motion to

the slide carrying the cutter head operating on the work.

In addition to turning propellers the machine will also deal with struts and other irregular shaped work up to 12 inches diameter by 14 feet long.

As sole agents for the Defiance Machine Works we shall be pleased to place the services of a wood-working specialist at the disposal of anyone interested in propeller manufacture.

Guarantees of production can be given together with advice on the best method of operating the machine.

Sole Agents:

**ALFRED HERBERT, LTD., COVENTRY.**



# **GNÔME & LE RHONE ENGINE COMPANY**

**Contractors to the  
War Office and Admiralty**

**London Offices :**

**27, BUCKINGHAM GATE, S.W.1., and THE HYDE, HENDON, N.W.9.**

**Works: Blackhorse Lane, Walthamstow.**



**WOODSIDE ENGINEERING COMPANY, LTD.,  
POSSILPARK, GLASGOW.**

# **AEROPLANE TIERODS**

IN :

**STREAMLINE AND ROUND SECTIONS**

COMPLETE WITH

**UNIVERSAL OR FORK JOINTS**

**LARGE STOCKS.**

**PROMPT DELIVERY.**

**Telephones.**

**WORKS: 1495 Douglas (2 lines.)**

**OFFICE: 3456 Central (3 lines.)**

(Private Branch Exchange.)

**Telegrams: "FUSELAGE," GLASGOW.**

**Registered Office**

**50 WELLINGTON STREET,  
GLASGOW.**



“ “ CONTRACTORS TO “ “  
HIS MAJESTY'S WAR OFFICE

*Messrs. Gordon Watney & Co. Ltd*

**AERONAUTICAL AND  
GENERAL ENGINEERS**

**South Lodge Motor Factory**

**WEYBRIDGE**



**Telephones WEYBRIDGE 550 (7 lines),      Telegrams: "MERCEDES, WEYBRIDGE."**



# AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER

## The Future of the Scientific Engineer.

BY "MEDWAY."

Somebody has said that an engineer is "a natural mechanic, scientifically educated." Someone else, almost certainly an American, has defined him as "a man who can do well for one dollar what any fool can do badly for two."

This latter is nice and epigrammatic, but does not altogether cover the case. There are branches of engineering into which, at certain times, the question of dollars does not enter far. One would not deny the title of engineer to a man who could produce the best aeroplane or aero-engine altogether regardless of cost, though the time will come when his unaided services will be at a discount.

To my mind, the scientific engineer may be described as a man who sets overmuch store on theory and not quite enough on practice. He needs balancing by the "practical man," who is generally not quite practical enough to realise that he can save himself a lot of unnecessary labour by applying theory intelligently.

### A SCIENTIFIC EXAMPLE.

He probably shares with the writer the somewhat discouraging memories of chemistry classes at school. The first twenty minutes were taken up by the lecturer in explaining why, when he should mix certain chemicals together in a certain order, the result would be a blue liquid, which would immediately crystallise and become very cold. The next five minutes was devoted to the necessarily delicate manipulations.

Then followed an interval for thought, on observing that the much-explained mixture had turned bright red, and had begun to boil furiously. And the rest of the hour was taken up by an explanation of how the presence of various anonymous impurities had vitiated the result of what would otherwise have been a most instructive experiment.

### PRACTICE VERSUS THEORY.

Pure theory applied to aeroplane construction is apt to lead to rather parallel consequences. The theorist is left explaining why his machine has failed, while the practical man, tired of listening, has impolitely flown away in a machine that could be proved by any self-respecting theorist to be incapable of flight.

But to my mind, all this does not really mean that theory is no good—that scientific and industrial research should not be attempted—but rather that theory should be harnessed to practice, and not allowed to run wild. In the past the British ten-

dency has been too much towards ridiculing the scientific man, paying him badly or not paying him at all—and in either case getting no more than we pay for—or leaving him to work out his own salvation without the guidance of that sound commercial common sense that he too often lacks.

### COMBINING ABILITIES.

We cannot, as a rule, get all qualities combined in one man. Consequently, we must buy them in separate men, and co-ordinate their work. If we pay the commercial man and the practical engineer well, we get good business and good constructional engineering. If we pay the scientific man badly, we are pretty certain to get faulty science which will not hold water.

The next move should be to experiment in encouraging the right men to specialise in science, by paying the scientist a decent wage, and giving him decent opportunities of advancement. The school chemistry experiment really went wrong because the school got a cheap man, and regarded "stinks" as of no consequence compared with the importance of a proper knowledge of Greek aorists and Latin prosody.

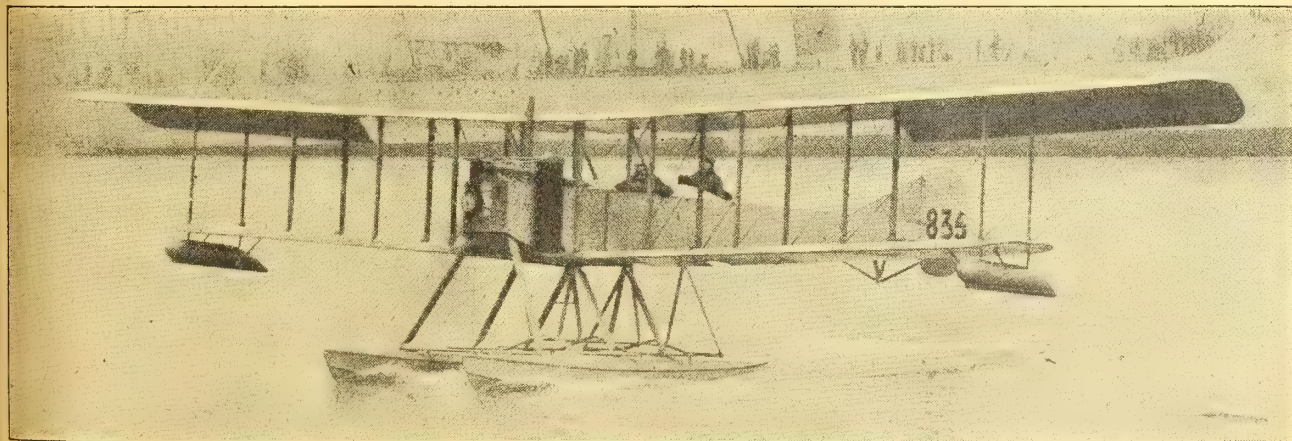
### SCIENTIFIC RESEARCH.

We shall be starting on the right lines if we begin with joint research, appointing a really good man, on a really good salary, to conduct it, subject to a modest degree of supervision and control by those who pay for it.

Then, in connection with each individual factory, we ought to have at least one good scientist with some engineering knowledge, who will take the results of the joint research and try to apply them to the particular productions of his firm, consulting the practical and works engineers from time to time, not necessarily bowing to their decisions, but being allowed to find out for himself whether he or they are in the right.

Only by some such means will the individual firm benefit fully from the results of joint research, and from the availability of exact and tabulated information as to what others have done and are doing.

The scientific and technical man must be recognised. He may be regarded as a speculation, but he must not be disregarded altogether, and, like other speculations, he must only be taken up by those who have the courage to back their fancy to a substantial amount.



A Wright Seaplane of early type.



## Co-operative Research.

THE MEANS OF ORGANISING AND FINANCING AERONAUTICAL RESEARCH, AND THE ADVANTAGES LIKELY TO ACCRUE TO THE AIRCRAFT INDUSTRY FROM CO-OPERATIVE ACTION.

BY "DIOGENES."

### III. MEMBERSHIP AND CONTROL OF A RESEARCH ASSOCIATION.

The question of the membership of a Research Association may seem to be pre-determined by the regulations of the Research Department, assuming that it is decided to solicit Government support. However, when we come to think the matter over, it is not quite so simple. Presumably a Research Association for the Aircraft Association would be fathered by the Society of British Aircraft Constructors, though in order to obtain a Government grant it would have to have a separate constitution and existence.

The first question is then whether the membership could be, or should be, limited to that of the parent body. Presumably, the S.B.A.C. takes adequate precautions to ensure that no firm which is not genuinely British is admitted to its ranks. The same qualification, if any exact definition exists, could probably be applied to membership of the Research Association. The simplest arrangement of all would be to place in the articles a bald statement that membership of the Research Association is confined to members of the S.B.A.C.

In this connection there are two questions to be considered. The first is whether the Government would accept this limitation. In some somewhat parallel instances they have done so. Much depends upon whether they can be clearly convinced that the parent body is not a profit-making concern or a price-raising ring, and, furthermore, that it is not a close corporation acting in the interests of a group, and possibly excluding some firms who ought to be admitted. There ought to be no great difficulty in convincing the Research Department on these points.

#### INDIVIDUAL MEMBERSHIP.

The other is the question of whether we should not wish to admit individuals who might be deeply interested in Research and might be valuable additions to the membership. Doubtless this could be provided for by creating a class of associate member with special provisions as to subscriptions.

Reverting to the qualification of the ordinary member, which must presumably be a firm or company connected with the manufacture of aircraft, it is well to consider in advance one or two possible causes of trouble later on.

There is no generally recognised definition as to what is meant by the term British manufacturer. The S.B.A.C. might hold one view and the Research Department another. Some firm excluded by the S.B.A.C. might put forward a protest against exclusion from the Research Association. The Research Department might consider the firm eligible and, as a big subscriber to an Association utilising ratepayers' money, might insist upon its decision being accepted.

This is, of course, only a contingency which may never arise, but there are various ways in which it could be met in advance. One would be by making the subscription to the Research Association much higher for firms not being members of the S.B.A.C., and only accepting such firms at all if the Government insisted upon it.

Some provision would have to be made under which all the privileges of membership would be forfeited and a substantial fine paid in the event of a member allowing confidential information to reach anyone outside. Otherwise the main object, which is to give British industries an advantage over foreign, would probably not be achieved, owing to leakage in information.

As regards control of the Association when formed, the Research Department obviously expects the actual work of Research to be put into the hands of a well qualified Director of Research, who will be responsible for carrying out the programme outlined by his Board or Executive Committee and approved by the Research Department. Obviously any man who may be appointed to this position must be a first class scientific engineer. His salary must be a considerable item. A cheap man would be useless.

It is not to be imagined that, however good the man appointed may be, the members who put up the money will give him a perfectly free hand to do as he pleases. Unquestionably, the people who find the cash must have some voice in deciding how it is to be spent. On the other hand, if an Association of this kind were wholly or mainly controlled by the commercial man, and the technical man were quite subservient to him, it is probable that much valuable work would never be undertaken because the direct commercial advantage immediately obtainable from it was not evident.

#### THE BOARD OF CONTROL.

Thus we are led to the conclusion that the Board of Control must comprise a strong element of technical men, though this element must not be so strong that the commercial interests of manufacturers cannot be properly safeguarded.

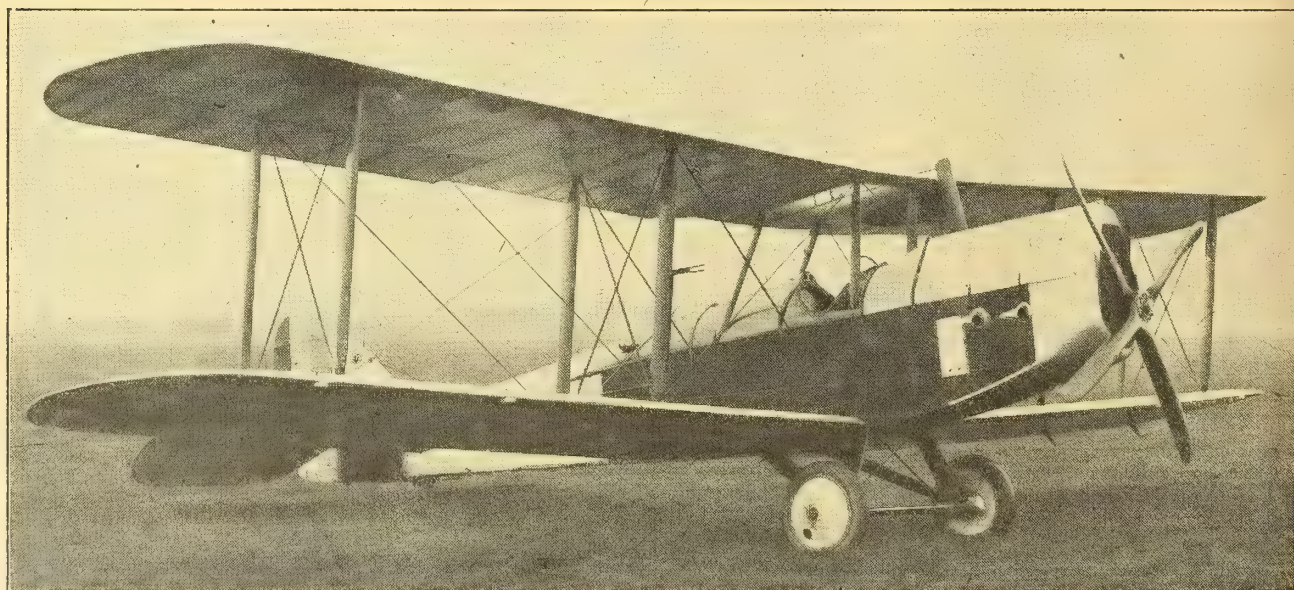
Probably the Board of Control would have to be a fairly large body, since no one would care to subscribe a substantial amount and to have no hand whatever in regulating the expenditure and drawing up the programme.

At the same time, if the Director of Research were made subject to a large board of twenty or thirty people, his life would probably be made a misery to him. Consequently, between the Board and the Director, there ought to be some intermediate body of a highly technical character responsible for appointing and looking after the Director and his staff, and also advising the Board on purely technical questions, with a clear understanding that its advice would not be turned down so long as it conformed with the views of the Board as to the total expenditure permissible.

These various considerations lead to the conclusion that the general constitution would be somewhat as follows:—

Firstly, there would be a Board of Control so large that any substantial subscriber would be able to get a seat upon it for himself or his representative. This Board would deal with finance and decide how much money should be spent in each period.

In broad terms, it would arrange for the programme of Research prepared by the Technical Committee to be carried



A de Havilland IV Biplane (with B.H.P. Engine).



Telephone:—

OFFICE ... 912 REGENT.  
WORKS ... 4762 KENSINGTON.  
281-2-3 WEMBLEY.

Telegrams:—

"SOCIABLE, PHONE,  
LONDON."

# HOOPER & CO. LTD.

**AEROPLANE BUILDERS  
TO H.M. AIR COUNCIL.**

**MOTOR-BODY BUILDERS**

TO



BY ROYAL WARRANT.



BY ROYAL WARRANT.



BY ROYAL WARRANT.

HIS MAJESTY THE KING.

HER MAJESTY THE QUEEN.

HER MAJESTY QUEEN ALEXANDRA.

H.I.M. MARIE DOWAGER EMPRESS OF RUSSIA.

H.R.H. THE DUKE OF CONNAUGHT.

**HOOPER & CO. are also Coachbuilders to**

H.M. The King of Spain.

H.R.H. The Princess Royal.

H.M. The King of Norway.

H.R.H. Princess Louise, Duchess of Argyll.

H.M. The Queen Mother of the Netherlands

H.R.H. Princess Victoria.

**54, St. James's Street,**

**PICCADILLY, LONDON, S.W.1.**



out. It would, no doubt, also put up proposals from time to time to its Technical Committee. The Board would consist not only of subscribing members of the Association, but would be strengthened by the introduction of a certain number of eminent scientists who, without necessarily being actually engaged in the industry, might be of great assistance to it.

The Technical Committee would be a small committee formed of members of the Board possessing high technical qualifications. The majority, if not the whole of it, would be directly representative of subscribing members, but it might comprise one or two scientists not so connected. This Committee would appoint the staff and generally supervise the practical work. It would thus ensure that technical men would have a proper measure of control in an essentially technical matter, inasmuch as it would prepare the programme of work and see it carried out.

In addition there would be workers employed by the Association. The most important of these would be the Director of Research, but it is highly probable that another highly important official would also be required. This for the reason that one of the first things to do would be to collect, translate and co-ordinate existing information so that time should not be wasted in doing something which had already been done elsewhere.

This Information Bureau would need to be under the charge of a really good man. Technical qualifications would be absolutely essential, as otherwise the translations obtained would be bad and the selection of the work to be translated would be faulty.

Power of detail organisation would be equally essential, because, if it were lacking, a great deal of valuable information might be got together but no one would ever be able to put his hand upon it with any ease and certainty.

It is to be feared that this endeavour to sketch the nature of the organisation required has led to a rather rambling series of proposals. The thing looks easy enough at first, but is really an extremely difficult problem, and the most the writer can hope for is that his notes upon it may serve to draw attention to some desiderata which might otherwise have been passed over and thus have led to serious difficulties at some later date.

### THE LETTERING OF GERMAN AEROPLANES.

The following notes by a well-informed neutral correspondent will explain the system by which German aeroplanes are known by type-lettering, such as the C.III., D.IV., and so on:—

A recent paragraph of vacant situations for German test pilots of A, B, C, D, E, and G aeroplanes brought in various inquiries whether the letters were chosen for individual aircraft or the initials of certain marks, like Albatros, Brandenburg, Gotha or whether they were a type identification agreed upon by the German trade.

The latter idea being the right one, an explanation dealing with the covering of these letters will be of interest.

At the outbreak of war the large group of "Taube" (Dove) monoplanes—delivered more or less to a standard by firms like Albatros, D.F.W., Etrich, Jeannin and Rumpler—was classified by A, that of the 100-h.p. tractor biplane—manufactured chiefly by Albatros, Aviatik, D.F.W. and L.V.G.—being identified by the letter B.

When the monoplanes disappeared, the "Doves" being given up for the chief early war task of patrolling, some time passed

till the A class was again represented, and this by the Fokker, being terminologised A.II. against the A.I. machines starting the war.

Similarly, the B.I biplanes passed at the later part of 1915 into the B.II. aeroplanes, the main features of which were the diminished dimensions.

The war having by now taught lessons of how to equip for fighting, bomb-dropping, wireless directing of artillery, and photography work the C class was developed along the lines of and at the same time as the B.I. aircraft, the horse-power being increased to 160 in the C.I. type, which could in turn tackle each of the before-mentioned tasks.

The model C.II. showed an increase in horse-power to 175 with a decrease in dimensions, the equipment comprising bomb-dropping facilities through two cylindric holes in the body or for four bombs hanging below it.

In the C.III. the measures were still smaller—a span of 12 yards by 36 square metres in area—and the main feature being the presence of two machine guns—a fixed one, fired through the propeller by engine gearing released by the pilot and a movable one, operated on a gun turret by the observer.

The C.IV. type is equipped with engines of increasing horse-power, first of 220 h.p., either six cyl. Benz or eight cylinders Mercedes of two metres length, later a six cyl. Mercedes of 260 h.p.

When real air-fighting started, the Albatros, Friedrichshafen and Halberstadt D fighters were produced, confronting the Germans with their most difficult job of producing small and light aircraft of highest manœuvring capacity. Wherefore they cannot, in return for their first showing in efficient tackling of various aerial war stages, deny the direct British-French scout influence on the before-mentioned products.

This holds even for the E type, these being the Fokker and Pfalz Morane adaptation, with steadily increasing Oberursel (Gnome copy) motor power to the 160 h.p. limit, appearing by the middle of 1915 and not surviving the year of 1916.

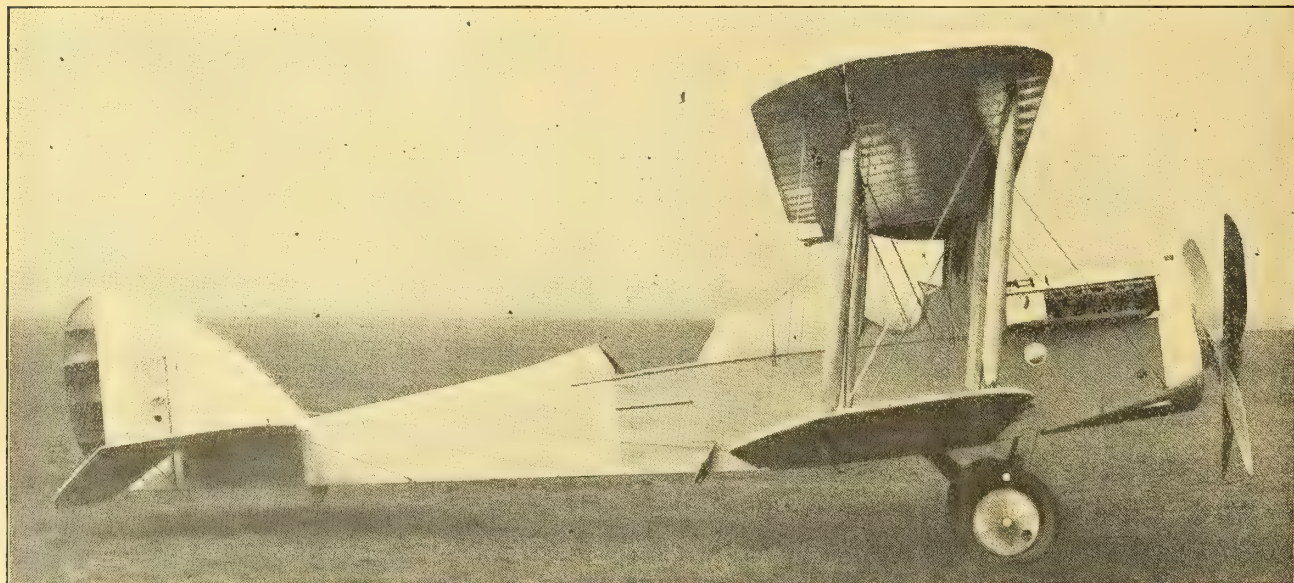
The letter F has curiously enough not verified its type by any specimens, wherefore one proceeds to the G class and ventures to point it out as the initial of the "Grossflugzeug" (giant aeroplane) class, represented by the Gotha A.E.G., Albatros and Siemens bombers, just as the D and E class coinciding with Doppeldecker for the scout biplane fighters and Eindecker for the corresponding monoplane type.

### A U.S.A. TRADE MOVE.

The U.S.A. Aeronautical Department has purchased the Rotary Engine Division of the Long Island City Factory of the General Vehicle Co. for £500,000, but the terms of the Government contract expressly protect the electric vehicle departments, and every facility will be provided for their increased production if required. It is understood that the present depletion of transport in the United Kingdom largely accounted for the decision not to interfere with the General Vehicle Co.'s export trade.

### BRITISH MAGNETO PRODUCTION.

It is now announced that up to the end of the year 1917 the members of the British Ignition Apparatus Association had manufactured and supplied over 30,000 British magnetos.



A de Havilland IV. Biplane (with Rolls-Royce Engine).





# AIRCRAFT MANUFACTURING COMPANY———LIMITED

Contractors to  
War Office and Admiralty

London Office

27, BUCKINGHAM GATE, S.W.1.

Offices & Works

HENDON, N.W.9.



**PATENTS INDEX.**

The subjoined list of recent inventions has been specially compiled by THE AEROPLANE from the current Official Patents Records:—

**PATENT APPLICATIONS.**

- Abernethy, N. Looms weaving aeroplane cloth jointing strip. No. 3467. February 27th.
- Annisson, R. H. Darts for airmen. No. 3568. February 28th.
- Austin, Sir H. Wire stays of aircraft. No. 3359. February 26th.
- Bridge, A. H. Clinometers for aerial use. No. 3428. February 26th.
- Brunton, J. D. Reducing vibration in wires, rods and cables of aircraft. No. 3383. February 26th.
- Cattle, A. J. Clinometers for aircraft. No. 3512. February 27th.
- Chapman, H. W. Straining-gear for bracing-wires, rods, etc. No. 3456. February 27th.
- Cotton, W. H. Hydroplanes. No. 3380. February 26th.
- Curtiss Motor Co. Aerial machines. No. 3425. February 26th.
- Curtiss Motor Co. Aerial machines. No. 3426. February 26th.
- Dowdall, J. W. Level of aeroplanes. No. 3537. February 28th.
- Fort, M. Fabrics for aeroplane wings, etc. No. 3651. March 1st.
- Hiscocks, S. W. Laminated spar for aircraft. No. 3639. March 1st.
- McIntyre, P. M. Liquid level for aeroplanes, etc. No. 3300. February 25th.
- Meyer, P. B. Apparatus for indicating departures from the level by aircraft. No. 3508. February 25th.
- Mooney, D. J. Web elements of aircraft structural members. No. 3438. February 27th.
- Mooney, D. J. Composite structural members for aircraft. No. 3439. February 27th.
- Negretti, P. E. Aeroplane accelerometer applicable as drift indicator or ground speed indicator. No. 3636. March 1st.
- Perkins, R. Roze. Automatic stabilising or controlling means for aircraft. No. 3424. February 26th.
- Perrigot, J. Balloons. No. 3484. February 27th.
- Pinkney, R. B. T. Electric height indicator. No. 3446. February 27th.
- Rayment, H. W. Float for seaplanes and flying-boats. No. 3331. February 25th.
- Reeves, H. K. Parachute. No. 3654. March 1st.
- Vickers, Ltd. Bomb-releasing apparatus for aircraft. No. 3704. March 2nd.
- Willey, E. M. Tanks for aircraft, etc. No. 3629. March 1st.
- Woyevodsky, N. Aircraft. No. 3677. March 2nd.

COMPLETE SPECIFICATIONS ACCEPTED, PRINTS OF WHICH CAN BE OBTAINED ON AND AFTER MARCH 21ST, 1918.

- 113,463. Jan. 24th, 1917. Nosworthy, W. H., and Prescott, S. J. Aerial propellers.
- 113,467. February 17th, 1917. Bolotoff, S. V. de. Means to receive strut-ends in aeroplanes and other structures.

**ABRIDGEMENTS OF RECENTLY PUBLISHED SPECIFICATIONS.**

- 112,309. **Aeronautics.** SMITH, W. H., 3, Newbury Road, Newbury Park, Essex, Jan. 2nd, 1917, No. 69.

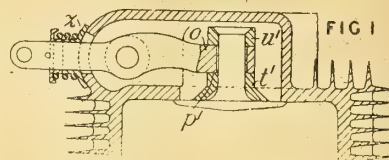
**FRAMEWORK.**—Strut-sockets for connecting parts of aeroplane, airship, and other light structures are provided with tensioning-reels to which the stay-wires are anchored. Figs. 1 and 2 show a sheet-metal device comprising a main socket *a* for a main beam of a structure, and sockets *b* to take subsidiary members. The stay-wires are secured to hollow, rotary tightening-bolts *d* having ratchet or other shaped heads engaged by detents and provided with holes *f* for engagement by a peg-spanner. The members *g* of the main socket are drawn together by bolts *h* which also serve for tensioning bracing wires. For this purpose, the bolts have ratchet beads *i* and

notched or serrated nuts *k*, both of which are locked by a pin passed through holes *l*. A modification is described in which the bolts *d* are duplicated, and an additional pair of bolts provided on one of the other sides of the socket *a*.

- 112,414. **Fluid-pressure Engines.** SOCIÉTÉ DES MOTEURS GNOME ET RHONE, 3, Rue la Boétie, Paris. June 18th, 1917, No. 8753. Convention date, December 29th, 1916. Not yet accepted. Abridged as open to inspection under Sect. 51 of the Act.

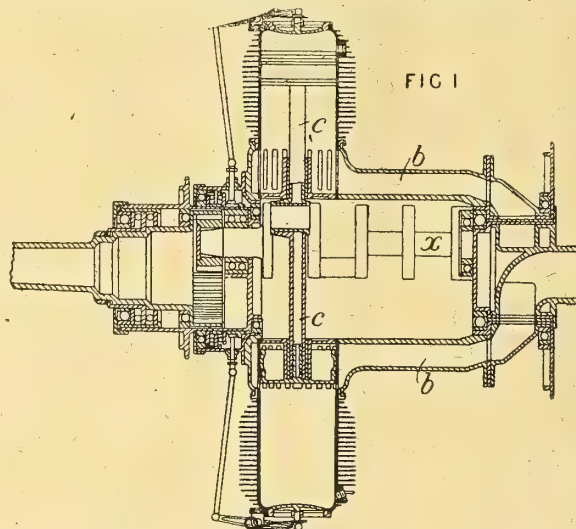
A valve mechanism of the kind described in Specification 106,472, the valve lever is provided with a hole through which the spindle loosely passes, and is secured to the

valve by means of a nut *u*<sup>1</sup> and washer *t*<sup>1</sup> having flat faces engaging flat bearing-faces *c*, *p*<sup>1</sup> on the end of the valve lever. The spindle is short, and the mechanism is housed in a low casing provided with a movable friction-joint cover *z* through which the actuating-lever passes. The casing may be applied to the construction described in the above-mentioned Specification, and to that described in Specification 111,084.



- 112,432. **Internal-combustion Engines.** GObé, A., DIARD, H., and ECLAIRAGE ELECTRIQUE, 8, Rue d'Agnesseau, Paris. December 4th, 1917, No. 17947. Convention date, August 28th, 1916. Not yet accepted. Abridged as open to inspection under Sect. 91 of the Act.

**TWO-STROKE-CYCLE ENGINES.**—The invention relates to an engine having two rotating cylinders in each of four parallel planes, each pair of opposite pistons being connected by a rigid rod *C* secured to a crank-shaft *x* mounted eccentrically to the



axis of the engine, the pump charges being drawn into the front ends of the cylinders and transferred to the combustion chambers of other cylinders through pipes *b*. The invention consists in the provision of cam-actuated exhaust valves in the heads of the cylinders, the exhaust period commencing before the opening of the admission ports and terminating prior to the end of the admission period.

- 112,438. **Ships; Aircraft.** BOIFFIN, P. J. B., 15, Rue Crucy, Nantes, France. December 17th, 1917. No. 18755. Convention date, December 30th, 1916. Not yet accepted. Abridged as open to inspection under Sect. 91 of the Act. Drawings to Specification.

Jets of superheated steam and mixed combustion gases are allowed to expand into the hollow propeller shaft and to pass through perforations in the hollow propeller blades so as to drive the vessel. The gases used are the combustion products of vaporised petrol and compressed air or vaporised petrol and hydrogen and oxygen formed by splitting sea water into its gaseous components. Explosion products also may be used. The propellers are driven also by a small steam turbine and are arranged at the bow and stern. Apparatus is described in which the superheated steam and gases are prepared and mixed prior to expansion.

**TO ADVERTISE THE WAR LOAN.**

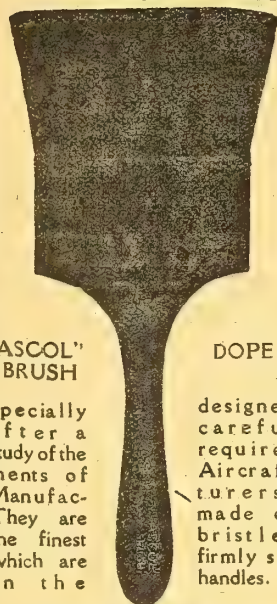
On Tuesday, March 5th, the War Loan campaign in Manchester was well advertised by a flight over the city by Fit. Lt. F. G. Browne, late R.N., on an Avro biplane, with Sir Alexander Parker, Lord Mayor, as passenger, which lasted an hour. During the flight many thousands of leaflets setting forth the advantages to be derived from investment in War Loan were dropped, and the Lord Mayor had a very good idea of what the cross-country pilot had to endure during unfavourable atmospheric conditions. On two occasions the pilot lost his bearings in the thick smoke and had to land in very awkward places to inquire his way, but by careful flying the forced landings were successful, and Trafford Park was safely reached at last. The Lord Mayor, who is in the immediate vicinity of three score years and ten, endured the experience nobly, and his first request upon landing was that he would like to smoke, which is definite evidence that the unusual experience resulted in no permanent harm.





## For Immediate Delivery.

We can supply large quantities from stock of "Ascol" Specialities here illustrated. Send us your requirements.



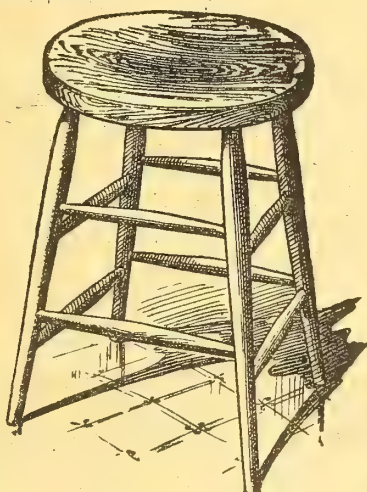
"ASCOL"  
BRUSH

Specially after a study of the requirements of Manufacturers. They are the finest which are in the

2in. 2/6, 3in. 4/6, 4in. 5/- each.

DOPE

designed careful require Aircraft turers. made of bristles firmly set handles.



FACTORY STOOLS  
(Wood).

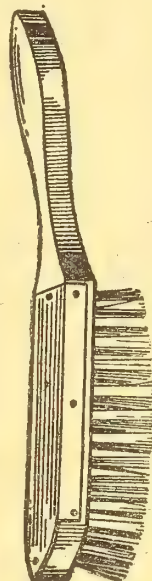
24 in. high 6/6 each.



ENGINE  
BRUSH.  
8/6 and 9/6  
per dozen.

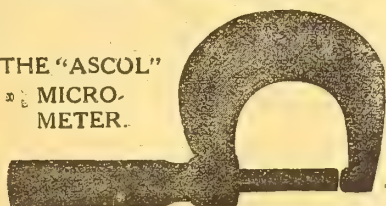


MOP  
BRUSH.  
4/2  
per dozen.



4-row  
SCRATCH  
BRUSH.  
(for burnishing)  
16/- per dozen.

THE "ASCOL"  
MICRO-  
METER.



Adjustment keys are supplied with each Micrometer, although adjustment should not be necessary until the instrument has been in use for some time. 30/- and 32/6 each.



"ASCOL" FILE HANDLES.

3 1/2 in. 3/6  
per dozen.

4 1/2 in. 4/6  
per dozen.

For full particulars of these and other items see "Aircraft Supplies," our Fortnightly House Journal. Sent free to the Aircraft Industry on application on business stationery. Illustrated Leaflets dealing with these and other "Ascol" Specialities are now ready and will be sent free upon request.

## THE AIRCRAFT SUPPLIES COMPANY LTD

CONTRACTORS TO THE AIR BOARD.

Head Offices, Showrooms, and Stores:

ASCOL HOUSE, 125 LONG ACRE, LONDON, W.C.2.

Representatives in Birmingham, Manchester, Leeds, Belfast, Northern Counties and Scotland, South Coast and the London District.

Managing Director:  
G. H. MANSFIELD.

Works:  
Little James St.  
London, W.C.1.



Telephone:  
Gerrard 276.  
(Private Branch Exchange.)

Telegrams:  
"Upcast, Rand,"  
London.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# The "Guardian Angel" Parachutes



- Ⓐ Up to the present we have had to seek illustrations of the utility of our Parachutes by directing attention to certain casualties, where, if they had been carried available for use, fatal endings of useful careers might have been prevented.
- Ⓐ What we want to be enabled to do, is, after the introduction of our Parachutes upon the Training Grounds, to illustrate the utility of our Parachutes by the records of accidents in which they have actually saved valuable lives.
- Ⓐ The "Guardian Angel" Parachutes have proved their utility and reliability in use with Aeroplanes, not only under all official tests, but also in actual military operations at the Front.
- Ⓐ Let the year 1918 be signalised by a great reduction of the fatal casualties upon our Training Grounds. It is quite feasible and **ALL THESE MEN ARE WANTED.**

*RELIABILITY—First.      RELIABILITY—Second.      RELIABILITY—ALL THE TIME.*

**E. R. CALTHROP'S AERIAL PATENTS, LTD.**

ELDON STREET HOUSE, ELDON STREET, LONDON, E.C.2.

Tel. hōnes (2 lines): London Wall 3266 and 3267.

Telegraphic and Cable Address: "Savemalivo-Ave-London."

## ALUMINIUM CASTINGS

OF EVERY DESCRIPTION.

We make a  
Speciality  
of  
Aeronautical  
and  
Automobile  
Work.

We are making many thousands of **Aluminium Die Castings** weekly under the celebrated **Cothlas** process—in many cases **entirely eliminating** machining operations, and we hold the sole manufacturing rights in the British Empire for this process.

Chemical and Physical tests are made on our own premises, and our **Castings**, both **Sand** and **Die**, are produced under the most up-to-date and scientific methods.

Sole makers of the **Birmal Aluminium Pistons**, thousands of which are running to-day in a highly satisfactory manner under the most severe conditions.

Highest  
Class  
Castings to  
Government  
Specifications.  
Prompt  
Delivery.

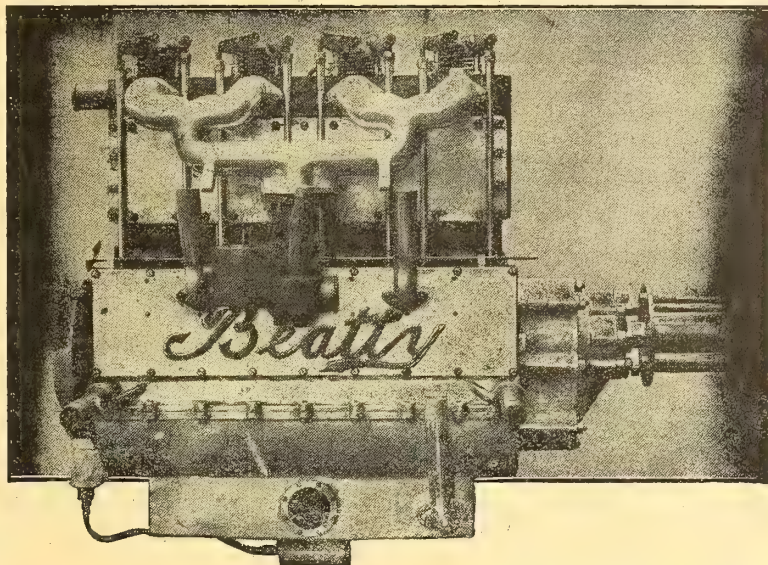
**BIRMINGHAM ALUMINIUM CASTING (1903) CO., LD.**

**Cambridge Street Works, BIRMINGHAM.**



# The Beatty Monobloc Aero Engine

H.P. = 60.  
R.P.M. = 1800  
Engine Shaft.  
Prop. speed =  
1200 R.P.M.  
Weight = 225 lbs



Petrol  
Consumption  
4.28 galls. per  
hour.

Oil  
Consumption  
.18 galls. per  
hour.

*Specially Designed and Developed for School Work.*

FULL PARTICULARS **The Beatty School of Flying Ltd.** LONDON AERODROME  
Telephone . . . . Kingsbury 138.

Contractors to H.M. Admiralty, War Office and Foreign Governments.

## The BRITISH CAUDRON CO., LTD.

SOLE BUILDING AND SELLING RIGHTS FOR

**Caudron Aeroplanes  
and Hydro-Aeroplanes**  
FOR  
**THE BRITISH EMPIRE AND DEPENDENCIES**

*Head Office and Works:*

**BROADWAY, CRICKLEWOOD, N.W.2.**

Cable and Telegraphic Address: "CAUDROPLAN, CRICKLE, LONDON."

Phone: 4647  
4648 HAMPSTEAD

*Scottish Factory and Aerodrome:*

**ALLOA.**

Cable and Telegraphic Address: "CAUDROPLAN, ALLOA."

Phone: 52

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



## Urgent Requirements.

### MATERIAL WANTED.

Offers required for the following:—

PLYWOOD,  $\frac{1}{16}$ ",  $\frac{3}{32}$ ",  $\frac{1}{8}$ ",  $\frac{3}{16}$ ",  $\frac{1}{4}$ ",  $\frac{5}{16}$ ",  $\frac{3}{8}$ ",  $\frac{1}{2}$ "

ALL TYPES OF METAL FITTINGS,

ALUMINIUM DIE CASTINGS,

and HOT BRASS STAMPINGS

for AVRO 504 J Biplanes.



**THE GRAHAME-WHITE AVIATION CO., LTD.,**  
AERONAUTICAL ENGINEERS.

### NOTICE

To DeH. Contractors.

We can supply *ex* STOCK  
BLANKINGS for all Metal Parts  
and AXLES complete.

*Special developments of the following:—*

Parts Nos. 9485	} Three blankings per set.
" " 9488	

Telephone:—Kingsbury 120 (5 lines).

Telegrams:—Volplane, Hyde, London.

**THE LONDON AERODROME, HENDON, N.W.9**

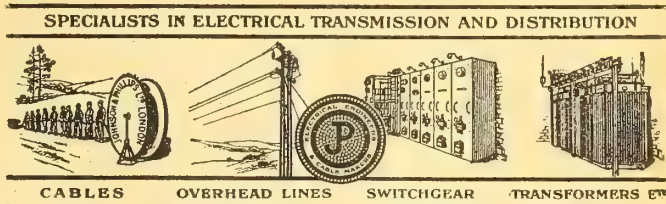
Proprietors of the London Aerodrome and the Grahame-White School of Flying.

**Non-Flame Celluloid**

Phone Central 1306 & 1307  
Telegrams "GREENBERG" LONDON

**GREENHILL & SONS**  
8 WATER-LANE LUDGATE-HILL  
LONDON. E.C. 4





*The Illustration shows a section of a 20,000 volt three-phase overhead*

## ELECTRIC POWER TRANSMISSION LINE

*lately completed by us for an outlying Government Mine.*

*The cheapest method of delivering power to Works, etc., in country districts.*

12, UNION COURT, OLD BROAD ST., LONDON, E. C. 2

**JOHNSON AND PHILLIPS LTD**  
ELECTRICAL ENGINEERS & CABLE MAKERS  
**CHARLTON, LONDON, S.E. 7.**

BIRMINGHAM 206, Corporation St. CARDIFF 9, Park Place. GLASGOW 159, W. George St. MANCHESTER 231, Deane Gate. NEWCASTLE-ON-TYNE 446, Blackett St. PORTSMOUTH Cleveland Rd Gosport

# A.G.S. Parts

*Day and Night Production.  
The most Modern Plant in  
London.*

## THE MEERLOO ENGINEERING CO., LTD.

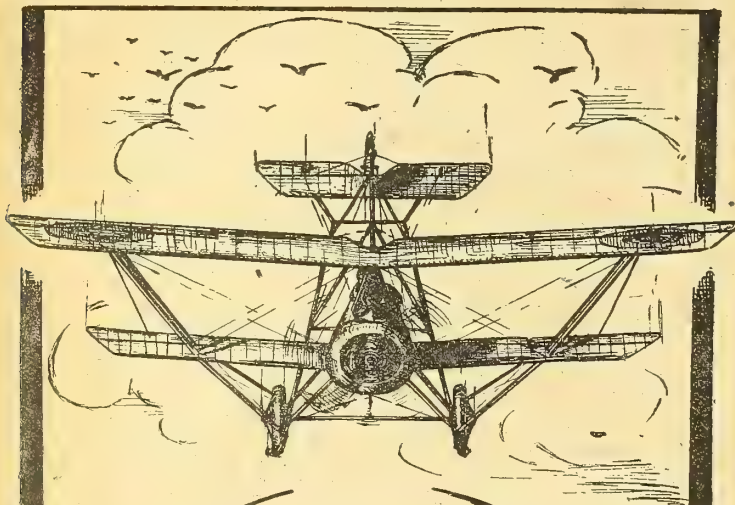
AERONAUTICAL ENGINEERS.

EASTERN WORKS, FOREST LANE  
STRATFORD :: LONDON, E. 15.

Managing Director:  
JOHN MEERLOO, Jun.

Telephone: STRATFORD 973.  
Telegrams: AEROMERCOL,  
PHONE, LONDON.





If You Want  
**TO LEARN TO FLY,**  
 Write to  
**THE**

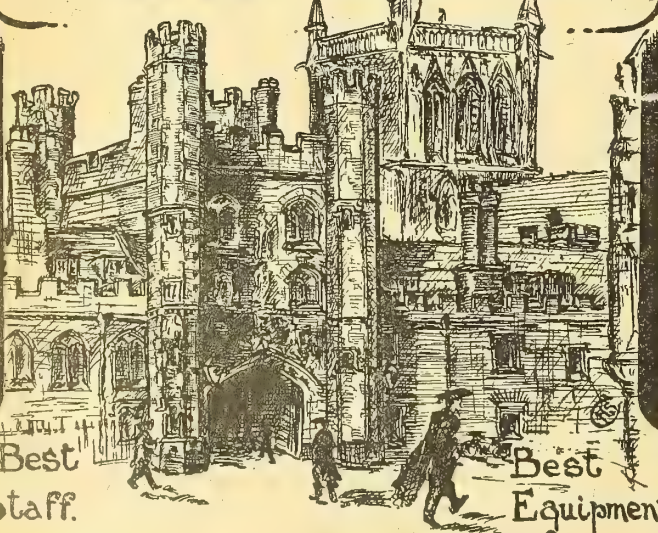
**CAMBRIDGE**

**SCHOOL OF FLYING**  
 and Aerodrome Co., Ltd.,  
 306, St. Andrew's St., Cambs.,

**TUTORS**  
 of

Piloting and Aero-engineering  
 for their

**1918 PROSPECTUS.**



Tel: Cambs. 5 and 1086.

Wire: "Carbon", Cambs.

**PULVO**

*If it's a small part  
 give it to Pulvo!*

*A Pulvo part is synonymous with an accurate, well-made, well-finished reliable article, delivered to time.*

*We specialise in De H. Fittings, but we are not in the least averse from making parts for other machines. On the contrary we are always at your service for any sort of Pressed, Welded, Turned, or similar work.*

*As we started so we finish—if it's a small part give it to Pulvo!*

**:: GET THE ::  
 PULVO HABIT.**

**The PULVO ENGINEERING Co. Ltd.**

10, 12, 14 and 16, DANE STREET, and  
 95 and 97, HIGH HOLBORN,  
 LONDON, W.C.1.

Telephone:  
 Holborn 410

Telegrams:  
 Pulvulpt, West-Cent.



# NIEUPOORT

AND

GENERAL AIRCRAFT COMPANY, L<sup>TD</sup>.

CONTRACTORS TO H.M. GOVERNMENT.

OFFICE AND WORKS—  
LANGTON ROAD,  
CRICKLEWOOD, LONDON, N.W.2

TELEPHONE (3 LINES)—  
WILLESSEN 2455

TELEGRAMS—  
NIEUSCOUT, CRICKLE, LONDON

CONTRACTORS TO THE ADMIRALTY.

Telegrams: "SUPERMARINE,"  
Phone: WOOLSTON 37.

ESTABLISHED 1912.

# The Supermarine

# Aviation Works L<sup>td</sup>

Designers and constructors of Aircraft.

FLYING WATER & SLIPWAYS:  
**WOOLSTON**

H SCOTT-PAINE, GENERAL MANAGER



OFFICES & WORKS:  
**SOUTHAMPTON**  
ENGLAND.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





# The Aeroplane

## Acceptance and Experimental Flights—

The Procter Isaac Aviation Co. "Aeromina,  
Pacey, London. Gerrard 278 (2 lines).

## Acetylene Welding Plant—

Acetylene Corporation of Great Britain, Ltd.,  
The, 49, Victoria Street, Westminster,  
S.W.1. "Flamma, Vic, London." Vic 4840.  
Imperial Light, Ltd., 123, Victoria Street, Lon-  
don, S.W.1. "Edibrac, Phone, London."  
3549 Victoria (3 lines).

## Aeroplane Manufacturers—

Aircraft Manufacturing Co., Ltd., Hendon.  
"Airmanship, Hyde, London."

Kingsbury 180.  
Armstrong, Sir W., Whitworth & Co., Ltd.,  
Newcastle-on-Tyne. "Armstrong Aviation,  
Newcastle-on-Tyne." Gosforth 500.

Blackburn Aeroplane & Motor Co., Ltd.,  
Olympia, Leeds. "Propellers, Leeds."  
Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane Works,  
Norwich. "Aviation, Norwich." Norwich 851.

British & Colonial Aeroplane Co., Ltd. (The  
Bristol Co.), Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British Caudron Co., Ltd., Broadway, Crickle-  
wood, N.W.2. "Caudronian, Crickle-  
wood." Hampstead 5551.

Central Aircraft Co., Palmerston Works, High  
Road, Kilburn, N.W.6. "Aviduction,  
Phone, London." Hampstead 4403 and 4404.

Davidson Aviation Co., Ltd., Hammersmith,  
W.6. Hammersmith 1992 (3 lines).

Eastbourne Aviation Co., Ltd., Eastbourne.  
"Aircraft, Eastbourne." Eastbourne 1176.

Graham-White Aviation Co., Ltd., London  
Aerodrome, Hendon. "Volplane, Hyde,  
London." Kingsbury 120.

Handley Page, Ltd., 110, Cricklewood Lane,  
N.W.2. "Hydrophil, Crickle, London."  
Hampstead 7420.

Hooper & Co., Ltd., 54, St. James St. Picca-  
dilly, London, S.W. "Sociable, St. James,  
London." Regent 612.

Mann, Egerton & Co., Aircraft Works, Nor-  
wich. "Motors, Norwich." Norwich 482 (4 lines).

Martinsyde, Ltd., Brooklands, Byfleet.  
"Martinsyde, Weybridge." Woking 331; Byfleet 171.

National Aircraft Co., Ltd., 15, Hackney Road,  
N.E.2. "Nieuport, London, N.W.2." Nieuport,  
Crickle, London." Willesden 2455.

Norman-Thompson Flight Co., Ltd., Bognor.  
"Soring, Bognor." Bognor 48.

The Regent Carriage Co., Ltd., 126/132, New  
King's Road, Fulham, S.W.6. "Carbodis,  
London." Putney 2240-2241.

Roe, A. V., & Co., Ltd., Manchester. "Tri-  
plane, Manchester." City 8530-8531; Manchester.

Saunders, S. E., Ltd., East Cowes, I.O.W.  
"Consuta, East Cowes." Cowes 193.

Short Bros., Rochester, Eastchurch and White-  
hall House, S.W. "Tested, Phone, London." Regent 378.

Sopwith Aviation Co., Ltd., Kingston-on-  
Thames. "Sopwith, Kingston." Kingston 744.

Standard Aircraft Manufacturing Co., Effing-  
ham House, Arundel Street, W.C.2.  
"Gunsingrush, Estrand, London." City 89.

Vickers, Ltd., Imperial Court, Basil Street,  
Knightsbridge, S.W.3. "Vickerlyta,  
Knights, London." Kensington 6810.

Waring & Gillow, Ltd., Hammersmith.  
"Warisen, Ox, London." Museum 5000.

Westland Aircraft Works, Yeovil. "Aircraft,  
Yeovil." Yeovil 129.

White, J. Samuel, & Co., Ltd., East Cowes.  
"White, East Cowes." Cowes 3.

Whitehead Aircraft (1917), Ltd., Richmond Sur-  
rey. "Whitecraft, Richmond, Surrey." Richmond 1865.

Wycombe Aircraft Constructors, Ltd., High  
Wycombe, Bucks. "Aircraft, High  
Wycombe." High Wycombe 84.

## Airships—

Airships, Ltd., High Street, Merton.  
Short Bros., Rochester, Eastchurch, and White-  
hall House, S.W. "Tested, Phone, Lon-  
don." Regent 378.

## Aluminium Castings (Sand & Die)

Coan, R. W., 219, Goswell Road, London,  
E.C.1. "Krankases, Isling, London." City 846.

## Bearings (Etonia Cast Phosphor Bronze)—

Yorkshire Engineering Supplies, Ltd., Wortley,  
Leeds. "Yes, Leeds." Central 3927.

## Brass Sheets for Tipping Propellers—

Pritt & Co., 46, Fenchurch Street, London,  
E.C.3. "Poetry, Fen, London." Avenue 995, 996, and 7006.

## Buildings—

Boulton & Paul, Ltd., Rose Lane Works,  
Norwich. "Aviation, Norwich." Norwich 851.

Palmer, T. W., & Co., Church Road, Merton  
Abbey, Surrey. "Wimbledon 1313

Rubery, Owen & Co., Darlston, South Staffs.  
The Willey Co., Ltd., Salisbury House, Lon-  
don, W.1. "Wrathless, Phone, City 2681-2

## Cable Coverings and Cable Controls—

Herbert Terry & Sons, Ltd., Redditch.  
"Springs, Redditch." Redditch 61.

## Capstan Work—

Gabriel & Co., 4 and 5, A B Row, Birming-  
ham. "Gabriel, Birmingham." Central 1223.

## Carburettors—

Hobson, H. M., Ltd., 29, Vauxhall Bridge  
Road, S.W.1. Victoria 4670.

## Casein—

Nieuwhof, Surie & Co., Ltd., 5, Lloyds  
Avenue, London, E.C.3. "Surico don, Fen  
London." Avenue 34 and 35.

## Castings—

Gabriel & Co., 4 and 5, A B Row, Birming-  
ham. "Gabriel, Birmingham." Central 1223.

## Castings (Aluminium, Brass, Bronze, Machined or Rough)—

Gabriel & Co., 4 and 5, A B Row, Birming-  
ham. "Gabriel, Birmingham." Central 1223.

## Celluloid (Non-Flam.)—

Greenhill & Sons, 8, Water Lane, E.C.  
"Greenberg, London." Central 1306-7.

London Label Co., Beckton Road, E 16 "Lon-  
label, Canning, London." East 1300.

## Clothing—

Burberry's, Ltd., Haymarket, S.W.1. Regent 2165.

Dunhill's, Ltd., Euston Road, N.W.1. "Dun-  
send, London." North 3405-6.

## Component Parts—

Accles & Pollock, Ltd., Oldbury, Birmingham.  
"Accles, Oldbury." Oldbury 111 (4 lines).

Central Aircraft Co., Palmerston Works,  
High Rd., Kilburn, N.W.6. Hampstead, 4728.

P.D.V. Aircraft Co., Ltd., Princes Street,  
Richmond. "Aeros, Richmond." Richmond 1681.

The Aircraft Construction Co., Harley Works,  
Beckton Road, E.16. "Aeracracons, Can-  
ning, London." East 1300.

Thompson Bros. (Bilston), Ltd., Bradley, Bil-  
ston, England. "Thompson Bros., Bilston." Bilston 10.

## Cords, Tapes, and Threads—

MacLennan, J. & Co., 30, Newgate Street,  
E.C.1. And at Glasgow. City 3115.

## Dopes—

British Aeroplane Varnish Co., Ltd., 166, Picca-  
dilly, W.1. "Tetrafree, Piccy, London." Gerrard, 2312.

British Cellulose Co., 8, Waterloo Place, S.W.1.  
"Cellulate, London." Regent 4046.

The British Emailite Co., Ltd., 30, Regent  
Street, S.W.1. "Ridleyren, Piccy, Lon-  
don." Gerrard 280.

Celton, Ltd., Broad Street House, New Broad  
Street, E.C.2. "Ajawb, London." London Wall 5659-3622.

Clark, Robert, Ingham & Co., Ltd.,  
House, Bedford Street, Strand, W.C.  
"Pearline, Westrand." Regent 3923.

## Engines and Parts—

Allen, W. H., Son & Co., Ltd., Queen's En-  
gineering Works, Bedford. "Pump, Bed-  
ford." Bedford No. 1.

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dum-  
fries." Dumfries 281-282.

The Beatty School of Flying, Ltd., The Broad-  
way, Cricklewood, N.W.2. Hampstead 3000.

Beardmore Aero Eng., Ltd., 112, Great Port-  
land Street, W.1. "Beardmore, London." Gerrard 248.

Dudbridge Iron Works, Ltd. (Salmon), 87,  
Victoria Street, London S.W.1. "Aero-  
flight, Vic, London." Vic 7026.

Gordon Watney & Co., Ltd., Weybridge.  
"Mercédès, Weybridge." Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham.  
Richmond 1293.

Gwynnes, Ltd., Hammersmith Iron Works,  
Hammersmith, W. "Gwynne, Ham-  
mersmith." Hammersmith 1010.

Napier & Son, D., Ltd., 14, New Burlington  
Street, London, W., and at Acton, W.  
"Nitriker, London." Gerrard 8926.

Robertson, J. H., & Co., 1, Albemarle Street,  
London, W.1. Regent 3096.

Rolls-Royce, Ltd., 14 and 15, Conduit St., W.1.  
"Rollhead, London." Gerrard 1654-56.

The Selsdon Aero & Engineering Co., Ltd.,  
1, Albemarle Street, Piccadilly, W.1.  
"Selaero, Phone, London." Regent 1181.

Sunbeam Motor Car Co., Ltd., Wolverhampton.  
"Moorfield, Wolverhampton." Wolverhampton 985.

The Gnome & Le Rhône Engine Co., Ltd.,  
47, Victoria Street, S.W. "Elevenfold,  
London." Walthamstow 408 (2 lines).

## Electrical Accessories—

Belling & Co., Derby Road Works, Montague  
Road, Upper Edmonton, N.18. "Belling,  
Edmonton." Tottenham 1984.

Johnson & Phillips, Ltd., Charlton, London,  
S.E.7. "Juno, London." Central 2207; London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland  
Street, Loughdon, W.1. "Installing, Eus-  
road, London." Museum 70.

Premier Electric Heaters, Ltd., 258, 259, and  
360, Bradford Street, Birmingham. "Fah-  
renheit, Birmingham." Midland 681.

The Rotax Motor Accessories Co., Ltd., Victoria  
Road, Willesden Junction, N.W.10.  
"Rodynalite, Phone, London." Willesden 2480.

## Electric Cables—

E. Kalker & Co., Coventry. "Kalker, Coven-  
try." Coventry 24x.

Johnson & Phillips, Ltd., Charlton, London,  
S.E.7. "Juno, London." Central 2207; London Wall 1564.

## Electric Lighting and Power—

E. Stanley Fardon, A.M.I.E.E., 67, Mosley  
Street, Manchester.

Johnson & Phillips, Ltd., Charlton, London,  
S.E.7. "Juno, London." Central 2207; London Wall 1564.

## Electro Platers and Metal Polishers' Engineers—

W. Canning & Co., 133-137, Great Hampton  
Street, Birmingham. "Materials, Bir-  
mingham." Birmingham 3622 Central (3 lines).

## Flare Lights

Imperial Light, Ltd., 123, Victoria Street, Lon-  
don, S.W.1. "Edibrac, Phone, London." 3549 Victoria (3 lines).

## Flexible Shafts—

Herbert Terry & Sons, Ltd., Redditch.  
"Springs, Redditch." Redditch 61.

## Flying Schools—

Bournemouth Aviation Co., Ltd., Talbot Vil-  
lage, Bournemouth. "Eiches, Winton." Bournemouth 1160.

Cambridge School of Flying and Aerodrome Co.,  
308, St. Andrews St., Cambridge. "Car-  
bon, Cambridge." Cambridge 5 and 1086.

## Furniture (Office)—

Cooke's (Finsbury), Ltd., Finsbury Pavement  
House, London, E.C.2. London Wall 573 and 6179.

## Galvanising—

Boulton & Paul, Ltd., Rose Lane Works,  
Norwich. "Aviation, Norwich." Norwich 851.

The Rustless Iron (Cowper Coles Process),  
Ltd., 1, French St., Sunbury-on-Thames,  
Middlesex. Sunbury 37.

## Gears—

Moss Gear Co., Ltd., Thomas Street, Aston,  
Birmingham. "Moggear, Birmingham." East 407.

## Glue—

Central Chemicals, Ltd., 283, West End Lane,  
London, N.W.6. "Entramical, Westham,  
London." London.

Improved Liquid Glues Co., Ltd., Gt. Hermi-  
tage Street, E. (Croid). "Excroiden,  
Wapp, London." Avenue 3178.

Mendine Co., 8, Arthur Street, E.C. Bank 5873.

Oldroyd, Wm., & Sons, Ltd., 9, Mincing Lane,  
E.C.3.

## Goggles—

Triplex Safety Glass Co., Ltd., 1, Albemarle  
Street, Piccadilly, W.1. "Shatterlys, Piccy,  
London." Regent 1340.

## Gauges—

J. A. Prestwich & Co., Northumberland Park,  
Tottenham, N.17.

## Heating and Ventilating—

Chas. P. Kinnell & Co., Ltd., 65 & 65a  
Southwark Street, London, S.E.1. "Kinnell,  
London." Hop 372 (2 lines).

## Hollow Spars—

McGruer Bentwood Hollow Spar Co., Com-  
mercial Wharf, Lambeth, S.E. "Gabriel-  
son, Watloo, London." Hop 718.

Robert Young's Construction Co., Ltd., Canon-  
bury Works, Canonbury Street, Essex Rd.,  
London, N.1.

## Instruments—

British Wright Co., Ltd., 33, Chancery Lane,  
W.C.2. Holborn 1308.

## Instruments (Scientific, Alti- meters, etc.)—

The Cambridge Scientific Instrument Co., Ltd.,  
Cambridge. "Instrument, Cambridge." Cambridge 642.

Short & Mason, Ltd., Macdonald Road,  
Walthamstow, E.17. "Aneroid, Phone,  
London." Walthamstow 180.



# Buyers' Guide.



## Machine Tools—

Brewster & Co., 11, Queen Victoria Street, E.C.4. "Circumfuse, Cannon, London." City 768.

## Magneto Driving Pieces—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Magnetos—

The M-I. Magneto Syndicate, Ltd., Victoria Works, Coventry. "Cortlon, Coventry." Coventry 1008-1009.

The British Lighting & Ignition Co., Ltd., 204, Tottenham Court Road, W.1. "Vicks-mag, Phone, London." Museum 430.

Eriesson Manufacturing Co. (Berling Magneto), Buffalo, N.Y., U.S.A.

## Metal Manufacturers—

Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 42-43.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

## Metals in General—

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Pritt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fen, London." Avenue 605, 606, and 7006.

Samuel Mercer & Co., "Reconciled, Cannon, London." City 6342.

## Metal Parts and Fittings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

Aircraft Supplies Co., Ltd., Ascot House, 125, Long Acre, W.C.2. "Upcast, Rand, London." Gerrard 276 (2 lines).

Arnott & Harrison, Ltd., Hythe Road, Willesden Junction. "Willesden 2267."

Bayliss, Jones & Bayliss, Ltd., Wolverhampton. (Bolts and Nuts.) "Bayliss, Wolverhampton." Wolverhampton 1041.

The Birmingham Guild, Ltd., 45, Gt. Charles Street, Birmingham. "Handicraft." Central 3705.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

British Metal (Kingston), Ltd., Kingston-on-Thames. City 5240, 5241, 5242.

Guthrie J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

Lombard Rim and Tube Co., Lombard Street, Birmingham. "Lombard, Birmingham." Midland 211 (2 lines).

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Euston, London." Museum 70.

Mountford, Fredk., Ltd., Fremo Works, Lifford, Birmingham. "Fremo, Birmingham." Kings Norton 261.

Robertson, J. H., & Co., 1, Albemarle Street, London, W.1. Regent 3906.

Rubery, Owen, & Co., Darlaston South Staffs. Sankey, Joseph, & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66.

The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulvulpit, Phone, London." Holborn 410.

The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selaero, Phone, London." Regent 1181.

The Aircraft Construction Co., Harley Works, Beckton Road, E.16. "Aeracracons, Canning, London." East 1300.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston." Bilston 10.

Wooler Engineering Co., Ltd., Old Oak Common Lane, Willesden Junction, N.W.10.

## Metal Shearing Tools—

Montgomery, Smith, & Co., Ltd., Tangent Works, Keynsham, near Bristol. "Ingenuity, Saltford." Keynsham 21.

## Metal Spinnings—

Arnold & Sons, Giltspur Street, London, E.C. "Instruments, London." City 5240, 5241, 5242.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Metric Bolts—

Cashmore Bros., Zota Works, Hildreth Street, Balham, S.W. Battersea 415.

Rubery Owen & Co., Darlaston, South Staffs.

## Miscellaneous—

Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast." Belfast 4033-4034-4035.

Bowden Wire, Ltd., Willesden Junction. "Bowirelin, Harles, London." Willesden 2400 (3 lines).

British Metal (Kingston), Ltd., Kingston-on-Thames. Brown Bros., Ltd., Great Eastern Street, E.C.1. "Inbrowned, Bethroad, London." London Wall 6300.

Herbert Food Co., Ltd., Chapel-en-le-Frith. "Frodobralke, Birmingham." Central 793.

London Label Co., Ltd., Harley Works, Beckton Road, E.16. "Nonflamoid" Nonflammable Celluloid. "Lonlabel, Canning, London." East 1300.

MacLennan, J., & Co., 30, Newgate Street, E.C.1, and at Glasgow. Tapes, Cords and Threads. City 3115.

## Motor Cars—

Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

Mann, Egerton & Co., Ltd., 379/381, Euston Road, London, N.W.1. "Manegecar, Euston, London." Museum 70.

Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 530 (4 lin. 5).

## Nameplates and Labels—

British Metal (Kingston), Ltd., Kingston-on-Thames.

The Clegg Metal Engraving Co., Chatsworth Works, Worthing. "Clegg Worthing."

## Observation Panels—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterless, Piccy, London." Regent 1340.

## Parachutes—

E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemaivo, Ave, London." London Wall 3266-3267.

## Pattern Making—

Frank Ward, 6, 7 and 8, Allsop Street, Upper Baker Street, W. Padd 4743.

## Piston Rings—

British Chuck & Piston Ring Co., Coventry. "Rings, Coventry." Coventry 723.

## Plating, Nickel Silver and Electro Tinning—

Arnold & Sons, Giltspur Street, London, E.C. "Instruments, London." City 5240, 5241, 5242.

Bliss, E. W., & Co., 29, Pocock Street, Blackfriars Road, London, S.E.1. "Blissdon, London." Hop 4340.

## Presswork—

Rubery Owen & Co., Darlaston, South Staffs. Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Propellers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

Ebora Propeller Co., 11 & 12, Sunbition Park Terrace, Kingston-on-Thames. "Ebora, Kingston." Kingston 672.

Integral Propeller Co., Ltd. "Avirop, Hyde, London." Hendon 9. Kingsbury 104.

Lang Propeller, Ltd., Weybridge. "Aerosticks, Weybridge." Weybridge 520-521.

Mann, Egerton & Co., Ltd., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Oddy, W. D., & Co., Leeds. "Aircscrews, Leeds." Central 201, Leeds.

Stanley Aviation Co., 67, Kingsland Road, E.2. City 8347.

Westland Aircraft Works, Yeovil. "Aircraft, Yeovil." Yeovil 129.

The Foster Instrument Co., Letchworth, Herts. Foster Instruments, Letchworth. Letchworth 26.

## Rigging for Aircraft—

Craddock, Geo., & Co., Ltd., Wakefield, England. "Craddock, Wakefield." Wakefield 406.

## Rubber Tubing & Accessories—

Hancock, James Lynce, Ltd., 266, Goswell Road, London, E.C.1. "Manificator, Isling, London." City 3811 and 3812.

## Safety Belts—

Holmes, C. H., & Son, 38, Albert Street, Manchester. "Semloh, Manchester." City 1432.

## Screw-driving Machines—

Russell Bros. (Redditch), Ltd., Littleworth, Redditch. "Inventors, Redditch." Redditch 74.

## Seaplane Manufacturers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay, 345 (3 lines).

Gosport Aircraft Co., Gosport. "Flight, Gosport." Telephone No. 217.

Mann, Egerton & Co., Ltd., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

The Norman Thompson Flight Co., Ltd., Mid-dieton, Bognor. "Soaring, Bognor." Bognor 48.

Short Bros., Rochester. "Seaplanes, Rochester." Chatham 627.

Supermarine Aviation Co., Ltd., Southampton. "Supermarine, Southampton." Southampton 1337.

## Searchlights and Landing Lights—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

## Seats for Aeroplanes—

Bowser, E., Art Cane Works, 50 Park Lane, Leeds. Central 3473.

## Shackles—

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

## Sheet Metal Pressings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

Arnold & Sons, Giltspur Street, London, E.C. "Instruments, London." City 5240, 5241, 5242.

Blackburn Aeroplane and Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345.

W. H. Briscoe & Co., Ltd., 51 and 52, Park Street, Birmingham. "Brisk, Bham." Central 550.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

London Aluminium Co., Ltd., Westwood Road, Aston, Birmingham. East 497 Birmingham.

Rubery Owen & Co., Darlaston, South Staffs.

## Sheet Metal Work—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 48-0.

Arnold & Sons, Giltspur Street, London, E.C. "Instruments, London." City 5240, 5241, 5242.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Evans, Joseph, & Co., Ltd., Liverpool Street Mills, Birmingham. "Adept, Birmingham." Central 733 (3 lines).

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Rubery Owen & Co., Darlaston, South Staffs. The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 48-0.

The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selaero, Phone, London." Regent 1181.

Arthur Hill & Co., Silchester Road, North Kensington, W. Park 1443.

## Shock Absorbers (Elastic Cord)—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Sparking Plugs—

Lodge Sparking Plug Co., Ltd., Rugby. "Igniter, Rugby." Rugby 215.

Ripault, Leo, & Co., Ltd. (Oleo Plugs), 64a, Poland Street, W.1. "Ripault, Reg, London." Gerrard 7758.

## Springs—

Dart Spring Co., West Bromwich. "Dart, West Bromwich." West Bromwich 322.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61 (3 lines).

## Stampings—

Guthrie, I. B., & Son, 30, St. Mary Axe, E.C.3. Arnold & Sons, Giltspur Street, London, E.C. "Instruments, London." City 5240, 5241, 5242.

## Steel—

Firth, Thos., & Sons, Sheffield. "Firth, Sheffield." Sheffield 3230 to 3237.

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

Nicklin, Bernard, & Co., Birmingham. "Bernico, Birmingham." Smithwick 224.

## Steel Stamps and Markings—

John Meerloo & Sons, Cleveland Works, Cleveland Street, Mile End, E.1. "Dayhur, Phone, London." East 3331 (2 lines).

## Steel Tubes for Aeroplanes—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

## Taper Pins—

Mountford, Fredk. (Birmingham), Ltd., Fremo Works, Lifford, Birmingham. "Fremo, Birmingham." King's Norton 261-262.

## Tapes and Smallwares—

MacLennan, John, & Co., 30, Newgate Street, E.C.1, and at Glasgow. City 3115.

James North Hardy & Son, Ltd., 54, Portland Street, Manchester. "Hardson, Manchester." Central 6471.

## Timber—

Engineering Timber Co., Ltd., 6, Victoria Street, London, S.W. "Entikosil, Vic, London." Victoria 5073, 4210.

Brown, R. F., & F. W., Wollaton Saw Mills, near Nottingham. "Brown's Saw Mills, Wollaton." Nottingham 1526.

J. Owen & Sons, Ltd., 109a, Borough High Street, S.E.1. "Bucheron, London." Hop 3811 (2 lines).

BUYERS' GUIDE cont. on next page.







## The Aeroplane

## Buyers' Guide

## Acceptance and Experimental Flights—

The Proctor Isaac Aviation Co., "Aeromina,"  
P.O. London, Gerrard 278 (2 lines).

## Acetylene Welding Plant—

Acetylene Corporation of Great Britain, Ltd.,  
The 49, Victoria Street, Westminster,  
S.W.1. "Flamma, Vic, London," Vic 480.  
Lamp and Light, Ltd., 125, Victoria Street, Lon-  
don, S.W.1. "Edibra," Phone, London.  
3549 Victoria (3 lines).

## Aeroplane Manufacturers—

Academy Manufacturing Co., Ltd., Hendon.  
"Armstrong, Hyde, London."

Armstrong, Sir W., Whitworth & Co., Ltd.,  
Newcastle-on-Tyne. "Armstrong Aviation,  
Newcastle-on-Tyne." Gosforth 350.

Blackburn Aeroplane & Motor Co., Ltd.,  
Ovingdean, Leeds. "Propellers, Leeds."

Boulton & Paul, Ltd., Rose Lane Works,  
Norwich. "Aviation, Norwich." Central 1272.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

British & Colonial Aeroplane Co., Ltd., (The  
British Co.) Filton, Bristol. "Aviation,  
Bristol." Bristol 3906.

## Buildings—

Boulton & Paul, Ltd., Rose Lane Works,  
Norwich. "Aviation, Norwich."

Pulmer, T. W. & Co., Church Road, Merton,  
Surrey. "Aviation, Merton."

Rubery Owen & Co., Darlaston, South Staffs.  
The Watney Co., Ltd., Salisbury House, Lon-  
don, W.C.1. "Verdrie," City 2681-2.

Cable Coverings and Cable

Controls—

Harbert Terry & Sons, Ltd., Redditch.  
"Springs, Redditch." Redditch 61.

Capstan Work—

Gabriel & Co., 4 and 5, A B Row, Birming-  
ham. "Gabriel, Birmingham." Central 1223.

Carburetors—

Hobson, H. M., Ltd., 29, Vauxhall Bridge  
Road, S.W.1. "Victoria, London." Victoria 4679.

Casein—

Nicholas & Sons, Co., Ltd., 5, Lloyd's  
Avenue, London, E.C.3. "Sericum, Fen  
London." Avenue 34 and 35.

Castings—

Gabriel & Co., 4 and 5, A B Row, Birming-  
ham. "Gabriel, Birmingham." Central 1223.

Castings (Aluminium, Brass,  
Bronze, Machined or Rough)—

Gabriel & Co., 4 and 5, A B Row, Birming-  
ham. "Gabriel, Birmingham." Central 1223.

Celluloid (Non-Flam)—

Green & Co., 8, New Water Lane, E.C.  
"Green, London." Central 1307-7.

London Label Co., Ltd., 10, London  
Road, Canning, London. East 1300.

Clothing—

Burrows, Ltd., Haymarket, S.W.1.  
"Burrows, London." Regent 2165.

Dunhill, Ltd., Easton Road, N.W.1. "Dun-  
hill, London." North 3405-6.

Compressed Parts—

Acclies & Pollack, Ltd., Oldbury, Birmingham.  
"Acclies, Oldbury." Oldbury 111 (4 lines).

Central Aircraft Co., Ltd., 10, Crickle-  
wood, London, N.W.2. "Central, London." Central 1223.

P.D.V. Aircraft Co., Ltd., Princes Street,  
Richmond. "Aeros, Richmond." Richmond 1681.

The Aircraft Construction Co., Harley Works,  
Beckton Road, E.16. "Aeracrafts, Can-  
ning, London." East 1300.

Thompson Bros. (Bristol), Ltd., Bristol.  
"Thompson Bros., Bristol." Bristol 10.

Cords, Tapes, and Threads—

MacLennan, J. & Co., 30, Newgate Street,  
E.C.1. "And at Glasgow." City 3115.

Dopes—

British Aeroplane Varnish Co., Ltd., 166, Picca-  
dilly, W.1. "Tetraflex, Picca, London." Regent 2312.

British Cellulose Co., 8, Waterloo Place, S.W.1.  
"Cellulose, London." Regent 4046.

The British Emulsion Co., Ltd., 30, Regent  
Street, S.W.1. "Ridley, Picca, London." Regent 2312.

Celina, Ltd., Broad Street House, New Broad  
Street, E.C.2. "Ajawb, London." East 1300.

Clark, Robert, Ingham & Co., Ltd., 35-37,  
House, Bedford Street, Strand, W.C.2.  
"Pearline, Strand." Regent 3913.

Engines and Parts—

Allen, W. H., Son & Co., Ltd., Queen's En-  
gineering Works, Bedford.  
"Allen, Bedford." Bedford 10.

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dum-  
fries." Dumfries 281-282.

The Bentley School of Flying, Ltd., The Broad-  
way, Crickwood, N.W.2. "Bentley, London." Regent 2312.

Beardmore Aero Eng., Ltd., 122, Great Port-  
land Street, W.1. "Beardmore, London." Regent 2312.

Dudbridge Iron Works, Ltd., (Salmon), 87,  
Aldgate, Vic, London. "Aero,  
Vic, London." Vic 7026.

Gordon Warner & Co., Ltd., Weybridge.  
"Mercedes, Weybridge." Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham.  
"Green, London." Richmond 1203.

Gwynnes, Ltd., Hamersmith, Iron Works,  
Hamersmith, W. "Gwynnes, Hamers-  
mith." Hamersmith 1010.

Napier & Son, D., Ltd., 14, New Burlington  
Street, London, W. and at Aston W.  
"Napier, London." Regent 2312.

Robertson, J. H., & Co., 1, Albemarle Street,  
London, W.1. "Robertson, London." Regent 3906.

Rolls-Royce, Ltd., 14 and 15, Conduit St., W.1.  
"Rolls-Royce, London." Regent 3906.

The Selkirk Aero & Engineering Co., Ltd.,  
1, Albemarle Street, Piccadilly, W.1.  
"Selkirk, Phone, London." Regent 1881.

Supplies Motor Car Co., Ltd., Wolverhampton.  
"Moorfield, Wolverhampton."

The Tinsley & Le Rhine Engine Co., Ltd.,  
4, Victoria Street, S.W.1. "Tinsley, London." Victoria 4679.

Walthamstow 408 (2 lines)

Electrical Accessories—

Belling & Co., Derby Road Works, Montague  
Road, Upper Edmonton, N.18. "Belling,  
Edmonton." Tottenham 194.

Johnson & Phillips, Ltd., Charlton, London.  
"Johnson, London." Central 2207.

Mann, Egerton & Co., Ltd., 127, Cleveland  
Street, London, W.1. "Mann, London." Central 1223.

Premier Electric Heaters, Ltd., 228, 230, and  
300, Broad Street, Birmingham. "Fah-  
renheit, Birmingham." Midland 682.

The Rotax Motor Accessories Co., Ltd., Vic-  
toria Road, Willesden Junction, N.W.10.  
"Rotax, London." Willesden 2480.

Machine Tools—

Brewster & Co., 11, Queen Victoria Street,  
E.C.4. "Circumloc, Cannon, London." City 768.

Magneto Driving Pieces—

Herbert Terry & Sons, Ltd., Redditch.  
"Spring, Redditch." Redditch 61.

Magnetos—

The M.I. Magneto Syndicate, Ltd., Victoria  
Works, 1, Coventry. "Coventry, Coventry." Coventry 1008-1009.

The British Lighting & Ignition Co., Ltd.,  
201, Tottenham Court Road, W.1. "Vicks-  
ville, Phone, London." Museum 430.

Ericsson Manufacturing Co. (Berling Magneto),  
Buda, N.Y., U.S.A.

Metal Manufacturers—

Clifford, Chas. & Sons, Ltd., Birmingham.  
"Clifford, Birmingham." Central 42-43.

Evans, Joseph, & Co., Ltd., Liverpool Street  
Mills, Birmingham. "Adept, Birming-  
ham." Central 733 (3 lines).

Metals in General—

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.4.  
Pitt & Co., 46, Fenchurch Street, London.  
E.C.3. "Poetry, Fen, London." Avenue 1432.

Samuel Mercer & Co., 108, Upper Thames  
Street, E.C.4. "Reconciled, Cannon,  
London." City 6342.

Metal Parts and Fittings—

Acclies & Pollack, Ltd., Oldbury, Birmingham.  
"Acclies, Oldbury." Oldbury 111 (4 lines).

Aircraft Supplies Co., Ltd., Asol House, 125,  
Long Acre, W.C.2. "Upstart, Rand,  
London." Gerrard 275 (2 lines).

Arnold & Harrison, Ltd., Hynde Road, Wilm-  
sden Junction. "Wilm, Willesden 2480.

Baylis, Jones & Baylis, Ltd., Wolverhampton.  
(Bolts and Nuts). "Baylis, Wolverham-  
pton." Wolverhampton 1041.

The Birmingham Guild, Ltd., 45, St. Charles  
Street, Birmingham. "Handicraft." Central 3705.

Blackburn Aeroplane & Motor Co., Ltd.,  
Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

British Metal (Kingston), Ltd., Kingston-on-  
Thames. "Propellers, Kingston." City 5240, 5241, 5242.

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.4.  
"Guthrie, London." Regent 1881.

Lamhard Rinn and Tube Co., Lombard Street,  
Birmingham. "Lombard, Birmingham." Midland 211 (2 lines).

Mann, Egerton & Co., Ltd., 127, Cleveland  
Street, London, W.1. "Installing, Eu-  
road, London." Museum 70.

Mountford, Fredk., Ltd., Fremo Works, Lil-  
ford, Birmingham. "Fremo, Birmingham." Kings Norton 261-262.

Robertson, J. H., & Co., 1, Albemarle Street,  
London, W.1. "Robertson, London." Regent 3906.

Rubery Owen & Co., Darlaston, South Staffs.  
"Rubery, Darlaston." Darlaston 10.

Shropshire. "Sankey, Welling, Staffs." Welling 66.

The Pulver Engineering Co., Ltd., 10 to 16,  
Dane Street, High Holborn, London, W.C.1.  
"Pulver, Phone, London." Holborn 4101.

The Selsdon Aero & Engineering Co., Ltd.,  
1, Albemarle Street, Piccadilly, W.1.  
"Selsdon, Phone, London." Regent 1881.

The Aircraft Construction Co., Harley Works,  
Beckton Road, E.16. "Aeracrafts, Can-  
ning, London." East 1300.

The Rotax Motor Accessories Co., Ltd., Vic-  
toria Road, Willesden Junction, N.W.10.  
"Rotax, London." Willesden 2480.

Thompson Bros. (Bristol), Ltd., Bristol.  
"Thompson Bros., Bristol." Bristol 10.

Wooler Engineering Co., Ltd., Old Oak Com-  
mon, W.1. "Wooler, London." N.W.10.

Metal Shearing Tools—

Montgomery, Smith, & Co., Ltd., Tangent  
Works, Kewstham, near Bristol. "In-  
crease, Salford." Kewstham 21.

Metal Spinnings—

Arnold & Sons, Giltspur Street, London, E.C.  
"Instruments, London." City 5240, 5241, 5242.

Gabriel & Co., 4 and 5, A B Row, Birming-  
ham. "Gabriel, Birmingham." Central 1223.

Gosport Aircraft Co., Gosport. "Flight, Gos-  
port." Telephone No. 217.

Mann, Egerton & Co., Ltd., Aircraft Works,  
Norwich. "Motors, Norwich." Norwich 482 (4 lines).

The Norman Thompson Flight Co., Ltd., Mid-  
dleton, Bognor. "Soaring, Bognor." Bognor 48.

Short Bros., Rochester. "Scoplane, Rochester." Rochester 10.

Supermarine Aviation Co., Ltd., Southampton.  
"Supermarine, Southampton." Southampton 1337.

Short Bros., Rochester. "Scoplane, Rochester." Rochester 10.

Supermarine Aviation Co., Ltd., Southampton.  
"Supermarine, Southampton." Southampton 1337.

Short Bros., Rochester. "Scoplane, Rochester." Rochester 10.

Supermarine Aviation Co., Ltd., Southampton.  
"Supermarine, Southampton." Southampton 1337.

Short Bros., Rochester. "Scoplane, Rochester." Rochester 10.

Supermarine Aviation Co., Ltd., Southampton.  
"Supermarine, Southampton." Southampton 1337.

Short Bros., Rochester. "Scoplane, Rochester." Rochester 10.

Supermarine Aviation Co., Ltd., Southampton.  
"Supermarine, Southampton." Southampton 1337.

Short Bros., Rochester. "Scoplane, Rochester." Rochester 10.

Supermarine Aviation Co., Ltd., Southampton.  
"Supermarine, Southampton." Southampton 1337.

Short Bros., Rochester. "Scoplane, Rochester." Rochester 10.

Supermarine Aviation Co., Ltd., Southampton.  
"Supermarine, Southampton." Southampton 1337.

Short Bros., Rochester. "Scoplane, Rochester." Rochester 10.

Supermarine Aviation Co., Ltd., Southampton.  
"Supermarine, Southampton." Southampton 1337.

Machine Tools—

Brewster & Co., 11, Queen Victoria Street,  
E.C.4. "Circumloc, Cannon, London." City 768.

Magneto Driving Pieces—

Herbert Terry & Sons, Ltd., Redditch.  
"Spring, Redditch." Redditch 61.

Magnetos—

The M.I. Magneto Syndicate, Ltd., Victoria  
Works, 1, Coventry. "Coventry, Coventry." Coventry 1008-1009.

The British Lighting & Ignition Co., Ltd.,  
201, Tottenham Court Road,



**"The Aeroplane" Buyers' Guide.—continued.****Time Recorders—**

Gledhill-Brook Time Recorders, Ltd., 26, Victoria Street, S.W.1. Victoria 1310.

**Turnbuckles—**

Rubery Owen & Co., Darlaston, South Staffs.

**Tyres and Wheels—**

The Palmer Tyre, Ltd., Shaftesbury Avenue.  
"Tyricord, Westcent." Gerrard 1214 (5 lines)

**Undercarriages—**

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

**Varnishes—**

The British Emailite Co., Ltd., 30, Regent Street, S.W.1. "Ridleyppren, Piccy, London." Gerrard 280.

Clark, R. Ingham & Co., Walter House, Bedford Street, Strand, W.C. "Pearline, Westrand." Regent 3923.

Harland, W., & Son, Merton, London, S.W.19. "Harland, Wimbledon 45." Wimbledon 45 and 1395.

Naylor Bros., Ltd., Southall, Middlesex. "Naylor, Southall." Southall 30.

**Washers—**

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Herbert Terry & Sons, Ltd. Redditch. "Springs, Redditch." Redditch 61.

**Vices—**

C. and J. Hampton, Ltd., Sheffield. "Vices, Sheffield." Attercliffe 95.

**Watchmakers and Jewellers (Silver Models)—**

Goldsmiths' & Silversmiths' Co., Ltd., 112, Regent Street, W.1. Gerrard 9091 (3 lines).

**Welding and Cutting Plant—**

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

**Welding Repairs—**

Arnold & Sons, Giltspur Street, E.C.1. "Instruments, London." City 5240, 5241, 5242.

Barinar, Ltd., 10, Poland Street, W.1. "Barinar, Reg. London." Gerrard 8173.

The New Welding Co., 26, Rosebery Avenue, London, E.C.1. "Windoneeda, Holb, London." Holborn 5252.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

**Wind Shields—**

Auster, Ltd., 133, Long Acre, W.C. "Win-flector, London." Regent 5910.

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

London Label Co., Ltd., Hadley Works, Beckton Road, E.16. "Nonflamoid" Nonflammable Celluloid. "Lonlabel, Canning, London." East 1300.

**Wire Gauze—**

N. Greening & Sons, Ltd., 16, Finsbury St., London, E.C.2. "Setscrew, Finsquare, London." London Wall 1082.

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

**Wires and Cables (Aeroplanes)—**

Bruntons, Musselburgh, Scotland. "Wiremill, Musselburgh." Musselburgh 28.

Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466 (3 lines).

**Wirework—**

Terry Herbert & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

**Wood Refuse Suction Gas Producers—**

Ruston Proctor & Co., Ltd., Lincoln, England. "Ruston, Lincoln." Lincoln 580.

**Woodworking Machinery—**

Robinson, Thomas, & Son, Ltd., Railway Works, Rochdale. "Robinson, Rochdale." Rochdale 467.

Sagar, J., & Co., Ltd., Halifax. "Sawtooth, Halifax." Halifax 136.

Wadkin & Co., Leicester. "Woodworker, Leicester." Leicester 7614.

By Royal Warrant  
of Appointment.



ESTABLISHED  
1819.

**ARNOLD & SONS,**

Engineers and Instrument Manufacturers,

Sheet Metal Work, Sheet Metal Pressing, Stamping, Spinning, Acetylene Welding,  
Nickel Plating, Silver Plating, Electro Tinning, etc., etc.

STANDARD WORKS, LAWRENCE ROAD, TOTTENHAM, N.15

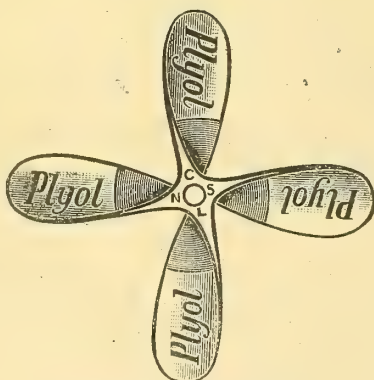
Head Office: GILTSPUR STREET, E.C.1.

Telegraphic Address:—"INSTRUMENTS," LONDON.

Telephone Nos.:—City Office: 5210, 5241, 5242 City. Factory: 2870 & 2271 Tottenham.

**"PLYOL"**

THE  
BEST CEMENT  
FOR  
THREE-PLY,  
Veneering, etc.



Registered Trade Mark.

**ALDGATE CASEIN WORKS.**

NIEUWHOF, SURIE & Co., Ltd.

HEAD OFFICE

5, Lloyds Avenue, London, E.C. 3.

Works:

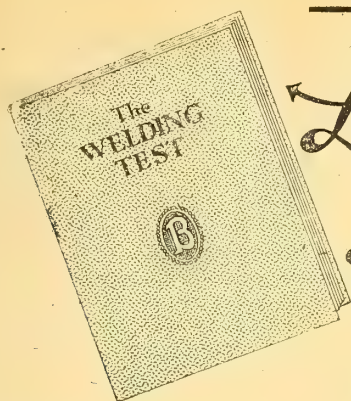
ALDGATE AVENUE, ALDGATE, E.C.

Also Caseln especially adapted for  
Waterproof Paints, Varnish, etc.

Telephones  
AVENUE 34, 35.

Telegrams:  
'SURICODON, FEN LONDON.'





# Look!

## It's Free

### Get this Barimar Manual by writ- ing for it NOW

Limited  
Edition for  
readers  
of The  
Aeroplane.

EVERY man who places an order for a Welding Repair wants to know something about the processes employed in doing the work.

That is only natural, as the Welding Industry is a new one, and comparatively few people know anything of this interesting development in the field of engineering.

We have written "The Welding Test" to supply the need for such information. The book is written in a simple manner, without leading the reader into a maze of technical matter, and it aims to aid the reader in a hurry to grasp the essential points of what can be done by Scientific Welding.

The published price of "The Welding Test" is 6d., but we know that many readers of "The Aeroplane" are using their cars on National Service, and may want repairs done quickly, so we have had a limited edition of "The Welding Test" printed specially for them.

Any reader of "The Aeroplane" who has a broken part that needs repair may have a copy of "The Welding Test" entirely free of cost.

Owing to the Paper Restriction Order, and the high cost of printing, we have not been able to print as many books as we wanted, so we hope that every reader who wants a copy will send his request at once. Please ask for manual "B.C." and mention "The Aeroplane."

Barimar Repairs are always satisfactory, as you are protected by our "Money-back" Guarantee if we fail. No repair is impossible. There is a Special Process for each kind of metal.

It is our business to help every owner of machinery used on Government work, Agriculture, National Service, etc. We can save stoppages through breakdowns.

Send repairs to Barimar by removing all fittings, attaching a label bearing your name and address, and sending the part carriage paid, address as below. Instructions should go by post.

Address to Dept. "B.C."

# BARIMAR

LIMITED,  
The Scientific Welders,

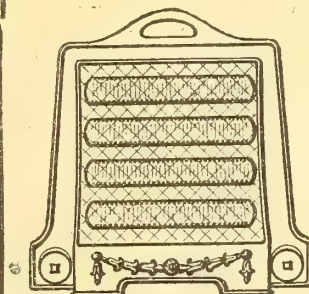
10, Poland Street, London, W.1.

Telegrams:  
Bariquamar, Reg., London,

Telephone:  
Gerrard 8 73.

## BELLING ELECTRICAL ACCESSORIES

### AIRCRAFT Manufacturing Purposes.



#### ELECTRIC FIRE.

OFFICE PATTERN. List No. 617.

An ideal fire for small offices, waiting rooms, passages, etc. We have also supplied a large number to Aerodromes for general heating. Numerous other designs are available.

PRICE 35/-

Dimensions—Height 17½ in.,  
Width 17½ in., Depth 5½ in.



#### ELECTRIC

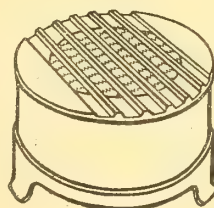
AIR WARMER.

List No. 960.

A reliable low temperature heating appliance, suitable for work rooms, etc. Can be used in any position without risk of fire.

PRICE 25/-

Dimensions—Length 15½ in.,  
Width 6½ in., height 4½ in.



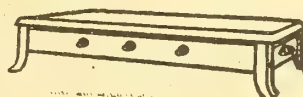
#### ELECTRIC

BOILING RING. List No. 7.

This will do all the same operations as an ordinary g.s. ring. Used for heating glue pots, and when loaded at 250 watts can be attached to any electric lampholder.

PRICE 15/-

Diameter 7 in.



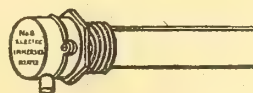
#### ELECTRIC

HOT PLATE. List No. 18

Useful for keeping food warm, and also for drying purposes of all kinds.

PRICE 100/-

Size 36 in. by 18 in.



#### ELECTRIC

IMMERSION HEATER.

A reliable appliance for heating water, oil and other liquids. Can be easily fitted to existing tanks, etc.

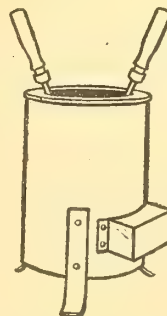
#### ELECTRIC

ENGINE WARMER.

For placing under engine in cold weather to prevent freezing. They are quite gas and fireproof.

PRICE 40/-

Size 12 in. by 7 in.



#### ELECTRIC

SOLDER POT. Type A.

This is the latest system for heating ordinary soldering irons, and consists of a pot of molten solder into which the irons are placed for a short time till heated.

PRICE 65/-

Dimensions—Outside diam. 8 in.,  
inner pan 5½ in. diam. at top,  
Depth 7 in.

All the above prices are subject  
to an advance of 25 per cent.

Our Catalogue illustrates many other special appliances we make for Manufacturing Purposes, Munition and Factory Work, Hospitals, Mess Rooms, etc.

**BELLING & CO., MANUFACTURING  
ELEC. ENGRS.,  
DERBY RD. WORKS, MONTAGUE RD., EDMONTON, LONDON, N.18**

KINDLY MENTION "THE AEROPLANE"

WHEN CORRESPONDING WITH ADVERTISERS.



# WARING & GILLOW

*Furnishers & Decorators to H. M. the King* LTD


CONTRACTORS  
TO THE  
WAR OFFICE AND ADMIRALTY.  
LIVERPOOL      HAMMERSMITH      LANCASTER



TELEPHONE No.:  
HAMMERSMITH 1980

HEAD OFFICE  
OXFORD ST. W.1

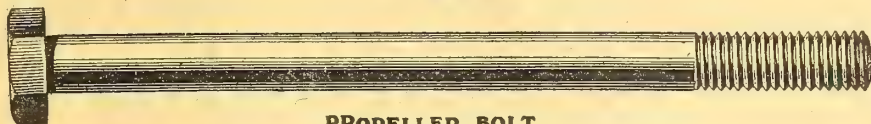
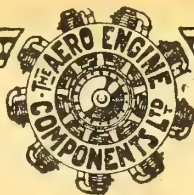
TELEGRAMS:  
"Warings Factories, Hammersmith."



The  
**WIGHT**  
SEAPLANE

**J. SAMUEL WHITE & CO., LTD.**  
EAST COWES, I.W.  
BUILDERS OF  
"WIGHT" Type Aircraft, Fast  
Torpedo Vessels, etc., etc., etc.  
Telephone: No. 3 Cowes.      Telegrams: White, East Cowes.





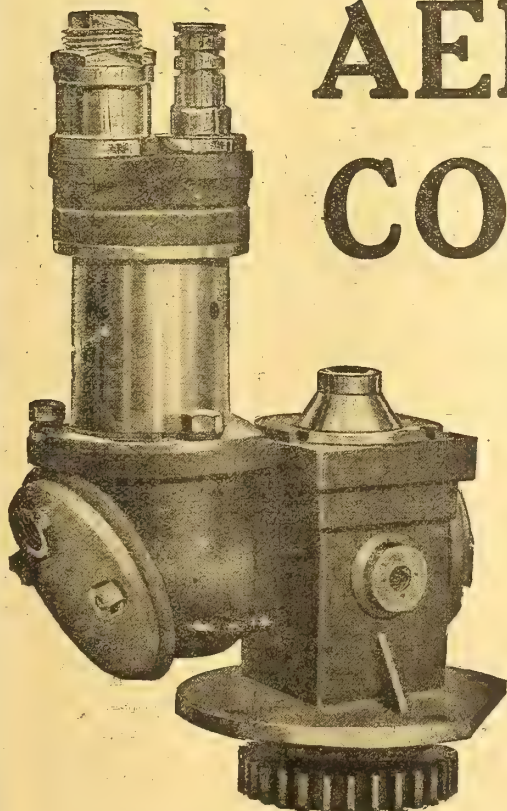
PROPELLER BOLT

**WE** are in a position to undertake the manufacture of Propeller Bolts and all Engine Parts.

Let us hear from you.

---

**The Aero Engine Components Company,**  
39, ST. JAMES'S STREET, LONDON, S.W.1.  
Telephone \_\_\_\_\_ 407 and 408 Regent.



# AERO ENGINE COMPONENTS

MANUFACTURED BY THE

**SELSDON**

**Aero and Engineering Co.  
Limited**

IMPERIAL HOUSE,  
KINGSWAY, W.C. 2.



# *H. & O., Ltd.* *Harris & Others, Limited,*

**AIRCRAFT CONSTRUCTORS,**

*Old Town, Clapham, S.W.4.*

**WOODWORK, METALS, COVERING AND DOPING.**

Phone: Battersea 1236  
1047

**Sub-Contractors to leading Aeroplane Builders.**

**On Admiralty and War Office Lists.**



## *VARNISHES . . .* *for* **AEROPLANES**

(SUBJECT TO A.I.D. INSPECTION)

**AIRSCREWS, SPARS, STRUTS, STAYS, ETC.**

**ROBT. INGHAM CLARK & CO. LTD.**

Offices: Walter House, Bedford St., Strand, W.C.2.

Telegrams—Pearline, Westrand. London. Telephone—Regent 3923.

Works: West Ham Abbey, London, E.15

Telephone—East 955, 956.



Contractors to the Admiralty and Air Board.



THE  
**CENTRAL AIRCRAFT COMPANY**

DESIGNERS AND CONSTRUCTORS  
OF AIRCRAFT.

Office and Works:

**KILBURN, N.W.6.**

Telegrams: Aviduction, Phone, London.

Telephone: Hampstead 4403, 4404.

Contractors to H.M. Government.

Telegrams:  
CARBODIS  
LONDON.

THE  
**REGENT**  
CARRIAGE Co. LTD.

Telephones:  
PUTNEY  
2240-1.

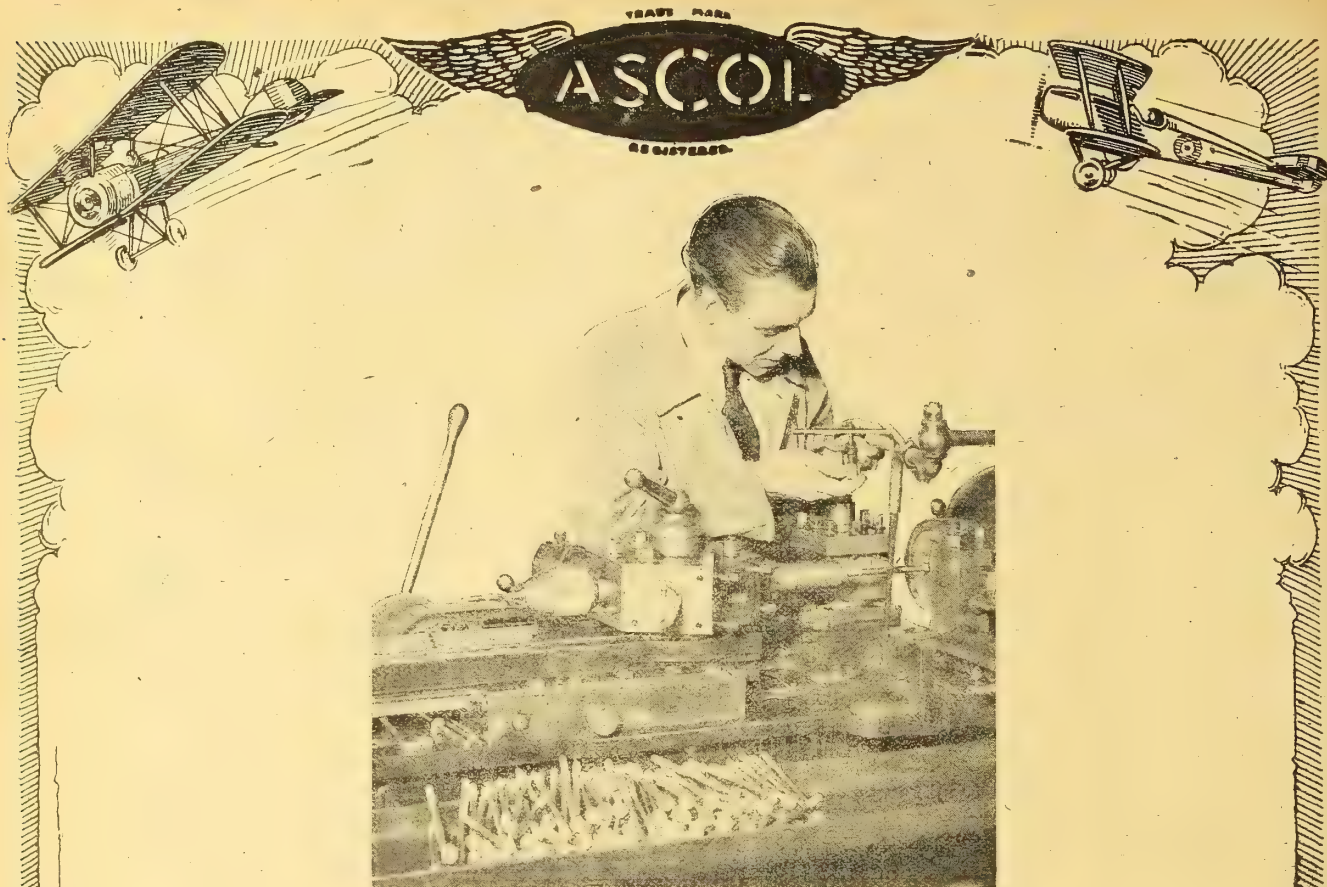
**AERONAUTICAL ENGINEERS**

Designers, Manufacturers and Contractors,

**126-132 NEW KINGS ROAD, FULHAM, LONDON, S.W.6.**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





ONE OF OUR No. 4 HERBERT CAPSTANS.

OUR illustration shows one of our No. 4 Herbert Capstans engaged upon making Propeller Bolts. The following is an extract from a letter we have received from a customer, in which they state "we are exceedingly sorry to say that we cannot get any more material to you before Thursday, but trust you will not have to break down the job before then. We are very pleased indeed with your deliveries and would say that you have given us the best deliveries of Propeller Bolts we have ever received."

### "Aircraft Supplies"

our Fortnightly House Journal is published on alternate Thursday evenings and contains complete List of Stock of Aircraft Parts up to the time of going to press, Current Prices, Details of New Items, Enquiry Bureau, Charts and Tables of various parts and Short Articles of interest to Aircraft Manufacturers. It will pay you to receive copies regularly, and these will be sent free on application on official or business stationery.

## THE AIRCRAFT SUPPLIES COMPANY LTD

CONTRACTORS TO THE AIR BOARD.

Head Offices, Showrooms, and Stores:

**ASCOL HOUSE, 125, LONG ACRE, LONDON, W.C.2.**

R representatives in Birmingham, Manchester, Leeds, Belfast, Northern Counties and Scotland, South Coast and the London District.

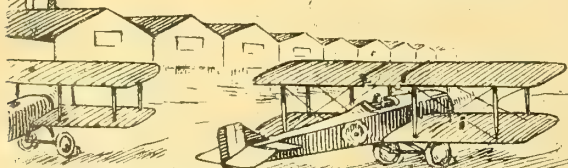
Managing Director:  
**G. H. MANSFIELD.**

Works:  
Little James St.  
London, W.C.1.



Telephone:  
Gerrard 276.  
(Private Branch Exchange.)

Telegrams:  
"Upcast, Rand."  
London.



KINDLY MENTION "THE AEROPLANE"

WHEN CORRESPONDING WITH ADVERTISERS.



# THE AIRCRAFT TRADER

## MARKET TOPICS.

(Prices are for quantities on usual terms.)

March 7th, 1918.

**COPPER.**—Although there appears to be plenty of Copper available at present, recent reports received from U.S.A. indicate that the fuel shortage and railway congestion have affected the output. It is, however, gratifying to learn that the position continues to improve.

Although Ingot Copper remains unchanged, there has been a revision in the price of strong sheets, the price having advanced £2 per ton. Brass and Copper Tubes, and Wire prices have also advanced.

**TIN.**—This market has been rather quiet during the past week. Prices, however, continue to indicate a state of uncertainty.

Stocks are not very large considering the ever increasing demand. The Ministry of Munitions is making an effort to increase the output of Cornish Tin Ore mines. It is understood that the Ministry has agreed with one firm that the net earnings received for Tin this year (or for duration of the war) in excess of the quantity sold in 1917, must be invested in Government securities. Briefly the other stipulations are said to be as follows:—

(1) The Company may upon cessation of hostilities, if desired, increase their capital and use the money invested as above for issuing fully paid shares to the shareholders.

(2) The money invested in accordance with this arrangement must not be distributed in dividends.

(3) The money may be used when desired for mining operations, plant, etc.

The position in U.S.A. is very serious. Shipments of Straits Tin from England have been stopped, and although Canadian producers have sent a little to U.S.A. they have informed the American authorities that they cannot give further permits without first obtaining the sanction of the British authorities.

**LEAD.**—The position of the Lead market remains unchanged. It is a little difficult to obtain supplies.

It is rumoured that there may be an advance in the U.S.A. price.

**STEEL.**—The strenuous efforts to meet the constantly increasing demands for Steel continue unabated. One has repeatedly heard rumours in the past of supplies coming forward from U.S.A. in order to relieve the situation here; and once more, it is rumoured, that now the American Government has taken complete control of all exports of Steel from that country, there may be a possibility of some Steel being shipped here.

There appears to be very little improvement in supplies of Cast Steel and H.S. Steel. Prices remain unchanged.

**TIMBER.**—There has been very little Silver Spruce received recently, and although large quantities of substitutes are available, there seems to be some doubt as to the use to which it must be put owing to the apparent unreliability of the timber.

No authentic information has been received. At the same time several Constructors have been instructed not to use the wood pending further investigations. The question of supplies of timber for aircraft use is still very serious, and calls for vigorous and immediate action, and it is one which can only be efficiently dealt with by the joint efforts of men with practical experience of aircraft timber requirements and timber importers.

There is plenty of English Ash available, but very little of it is dry.

Recent shipments of Mahogany have been very small.

Prices remain unchanged. It is of course impossible now to deal direct with Timber Merchants for aircraft timbers, all supplies being under the control of the Air Board.

**FABRIC.**—The question of available Flax supplies is still causing anxiety. There is, however, plenty of Fabric available to meet the immediate demands of the nation. Official prices have not yet been revised.

## MONTHLY MARKET PRICE LIST.

March 7th, 1918.

The prices given below are the prices ruling on the above date. TERMS.—Usual for the various materials mentioned. Prices of old metals are as quoted by scrap dealers. Prices must not be taken as specific quotations for definite quantities delivered to any part of the country.

### ALUMINIUM.\*

Ingot .....	£225 per ton.
Remelted .....	£210 per ton.

### BRASS.

Sheets .....	15½d. per lb.
Strip .....	14½d. per lb.
Wire .....	14½d. per lb.
Tubes .....	16½d. per lb.
Castings .....	16d. per lb.
Turning Rod .....	13½d. per lb.
Brazed Tubes .....	19½d. per lb.

### COPPER.

Ingot, Standard, Cash .....	£110 per ton.*
Ingot, Standard, 3 mos. ....	£110 per ton.*
Best Selected (net) .....	£123 to £119 per ton.
Sheets .....	£149 per ton.
Wire .....	15½d. per lb.
Tubes, S.D. ....	19d. per lb.
Tubes, Brazed .....	19d. per lb.
Rivets .....	1s. 11½d. per lb., basis.
Tacks .....	1s. 11d. per lb.

### FABRIC.\*

Linen, R.A.F., 17C, Spec., 36 in. wide, 2s. 8d. p. yd.
Linen, R.A.F., 17C, Spec., 38 in. wide, 2s. 9½d. p. yd.
Spaced, R.A.F., 17C, Spec., 37½ in. wide, 1s. 9d. p. yd.

### GUN METAL.

Castings .....	1s. 8d. per lb.
----------------	-----------------

### LEAD.\*

Virgin Pig .....	£29 per ton, c.i.f.
Virgin Pig .....	£30 per ton, ex stores
Sheets .....	£39 10s. per ton, D/d.
Pipes .....	£40 per ton.
Dry White .....	£46 10s. per ton, less 5 per cent.
White in Oil .....	£53 per ton
(lots over 5 cwt. less 5 per cent.)	
White in Oil .....	£55 per ton.
(lots under 5 cwt. less 5 per cent.)	
Red in Oil .....	£42 per ton, less 2½ per cent.

### NICKEL.\*

Nickel .....	£220 per ton.
--------------	---------------

### PHOSPHOR BRONZE.

Ingot, 5 cwt. and under .....	£156 to £178 per ton.
(Subject to Copper and Tin Fluctuations.)	
Castings .....	1s. 7½d. to 1s. 10½d. per lb.

### PHOSPHOR COPPER.

Ton lots .....	£200 to £205 per ton.
----------------	-----------------------

### SILVER.

Silver .....	42½d. per oz.
--------------	---------------

### SOLDER.

Plumber's .....	128s.
Tinman's .....	178s.

### STEEL.\*

High Speed, 14 p. cent., Tungsten, 2s. 10d. p. lb., basis.
High Speed, 18 p. cent., Tungsten, 3s. 10d. p. lb., basis.

### ALLOY STEELS TO AIR BOARD SPECIFICATIONS.† Round and Square:—

Specification No. S2 .....	£86
Specification No. S2 (bright-drawn) .....	£115
Specification No. S8 .....	£86
Specification No. S10 .....	£70
Specification No. S12 .....	£75
Specification No. S14 .....	£43
Specification No. S15 .....	£70
Specification No. S16 .....	£70



Specification No. S17 .....	£75
Specification No. S18 (oil-hardened) .....	£86
Specification No. K1 .....	£75
Specification No. K2 .....	£75
Specification No. K3 .....	£86

The above prices are for  $\frac{1}{4}$  in. to  $\frac{5}{16}$  in. only, other sizes are proportionate.

**HEXAGONS.**

	.455 and .525	.601 and .710.
Specification S2 .....	£79	£77
Specification S8 .....	£79	£77
Specification S2 (bright-drawn), .....	£112	£112
Specification S8 (bright-drawn), .....	£112	£112

**SPELTER.**

English f.o.b., Birmingham .....	£54-£50
----------------------------------	---------

**TIN.**

Tin .....	£319
-----------	------

**TINPLATES.\***

Tinplate .....	30s., basis, f.o.t.
----------------	---------------------

**TIMBER.****Official.****Merchants.**

Silver Spruce, 10s. 4d. ....	18s. c.f.
English Ash .....	As per Official Schedule.
Cypress .....	10s. 4d. .... 12s. 6d.
Mahogany, 1s. 6d. to 1s. 10d.—2s. 2d. to 2s. 6d. s.f.	
Walnut, 2s. to 2s. 3d. ....	2s. 3d. to 2s. 6d. s.f.

**ZINC.**

Zinc Sheets (American).....	£100, f.o.b., New York.
-----------------------------	-------------------------

**SCRAP MATERIALS (LONDON PRICES).****ALUMINIUM.**

Description. Price per ton on sale to refiner, delivered at refinery.

Sheet cuttings and rods containing a minimum of 96 per cent. Al. ....	£160 0 0
Old rolled, etc., containing a minimum of 96 per cent. Al. ....	120 0 0
Spinnings, punchings, and thin small scrap; also painted and varnished scrap that needs melting, containing a minimum of 96 per cent. Al. ....	105 0 0
Lump scrap from aero castings and material of equivalent value, containing 87 to 95 per cent. Al. ....	100 0 0
Turnings and Swarf, generally containing 87 to 95 per cent. Al. ....	87 10 0
Scrap, generally containing 80 to 86 per cent. Al. ....	80 0 0
Swarf and inferior Swarf, generally containing below 80—86 per cent. Al. ....	70 0 0
All Scrap, containing below 80 per cent. Al., not to exceed .....	65 0 0
All Swarf, containing below 80 per cent. Al., not to exceed .....	60 0 0
Brass, Heavy Selected .....	£88
Copper, Clean .....	102
Copper, Brazery .....	80
Gun-metal, Scrap .....	120
Lead, no Draft .....	26
Zinc, Old .....	42

\*Official Prices.

†Prices include Delivery in the U.K.

**AIRCRAFT INDUSTRY IN NORWAY.**

The following notice has been issued by the Northern Aircraft Co., Ltd., of Prinsengt, 4, Kristiania, Norway:—

DEAR SIR,—We have the honour to inform you that under the date of Dec. 19th, 1917, a Norwegian limited company has been established with a view of importing and dealing in aeroplanes, hydroaeroplanes, and aircraft motors of British construction in Scandinavia.

The company, the head office of which is in Kristiania, has been entered in the Tradé Register under the date of Dec. 31st, 1917.

The company, the name of which is A/S. Nordisk Luft-Kraft (the Northern Aircraft Co., Ltd.), has a capital of kr. 600,000 (about £40,000), which have been subscribed entirely by Norwegian subjects.

Enclosed we permit to send you a report for an exhibition of aeroplanes, hydroaeroplanes, and aircraft motors of British construction, which we intend to arrange in Kristiania during the summer, 1918.

We hereby have taken the liberty to submit our plans to you, trusting that same will meet with your interest, and also that your esteemed firm will join in the exhibition.

Our foreign representative, Mr. Xavier de Plane, who is shortly leaving for London, will have the pleasure personally to call on you with a view of further negotiations, and will also furnish you with necessary information regarding our concerns.

We beg to remain, dear sir, yours truly,

A/S NORDISK LUFT-KRAFT

(The Northern Aircraft Co., Ltd.)

The notice concerning the exhibition reads as follows:—

**EXHIBITION**

of Aeroplanes, Hydroaeroplanes, and Aircraft Motors, Kristiania, 1918.

**Report:—**

As you will be aware, British aeroplanes have been imported in Norway since the aeroplane industry was started, and our military flyers have been educated in England until the outbreak of the war.

The war, we regret to say, has prevented Norway from importing the necessary materials, and this has, in a very regrettable way, put a stop to the development of flying in Norway.

With the view of stimulating the great interest which Norway has always taken in flying, especially in the British flying, we have the intention to arrange an exhibition of aeroplanes, hydroaeroplanes, and aircraft motors of British construction in Kristiania, 1918, which would convince the Norwegian and Scandinavian public of the high standard, the famous development during the war, and the superiority of British aviation from the first time of flying until to-day.

This exhibition was meant to be the commencement of our propaganda for the British aviation. It is our intention to make an application to the British Government in order to obtain their permission to have one of each of the most important British types of aeroplane, flying boat, and aircraft motors sent over to Kristiania, only for exhibition, and not for sale, of course, with the exception of machines which for military reasons could not be exhibited.

We intend to arrange the above-mentioned exhibition during the summer, 1918, and invitation to take part therein will only be sent to British, French, and Italian constructors.

All expenses in connection with the exhibition will be covered by our company, which will also guarantee the value of the machines and their safe return to England.

The exhibition will be held with the aid of Norsk Luftseilads Forening (the Norwegian Aeronautic Club).

In this connection we should like to point out that, in our opinion, an exhibition of this kind, arranged during the war, would be of great importance to the British constructors, when taken in consideration the quick development of the flying and the great competition which will undoubtedly make itself felt as soon as the war is ended, even here in Scandinavia.

Kristiania, January, 1918.

[Undoubtedly it would be well if British aircraft constructors were able to exhibit their products in Kristiania with a view to business with the Scandinavian countries after the war, but there seems little possibility of permission being given for the export of aeronautical matériel. There is, of course, plenty to spare in the way of obsolescent and not quite obsolete machines and engines, which would give Scandinavian business men some idea of the quality of our workmanship, but, even so, one doubts very much whether permission would be given for the export of things which are of no use to ourselves. Being war material, we would rather burn them than let anyone see them, although the enemy may have examples of much more recent types.—Ed.]

**THE LAST STRAW.**

According to the "Vigilante" the manager of a firm making aeroplane parts for the Ministry of Munitions, has written to the Ministry as follows:—

During this great war, we have done many things that aforesaid we had considered almost impossible.

We have turned our ploughshares into swords; made night into day; made bricks without straws; turned water into wine; and ale into compound for the refreshing of labour.

We have resurrected, Lazarus-like, machine tools and taught them to rise up and sing. We have imported proud Americans. We have salvaged destitute Belgians.


We have gathered in and utilised Barbers, Circus Proprietors, Evangelists, Aborigines from the Antipodes, and some of "the Best People."

We have made women into mechanics, and mechanics into supermen such as may be found at the Ministry of Munitions. We have diluted our labour, both male and female, until we have workers of the combined sex, and neither sex.

We have praised God, honoured the King, and straffed their common enemies. But we stand to-day hopelessly cast down before the Ministry of Munition's suggestion that we should cut 2-inch module pitch aeroplane engine gears with a  $\frac{1}{2}$ -inch module cutter—Ichabod.

[If the writer of that letter ever finds himself out of a job, THE AEROPLANE would be glad of his services.—Ed.]





**CELLON**  
- NON-POISONOUS -  
**DOPE**

**CELLON, LTD.,**  
Broad Street House, E.C. 2.

Telephones: London Wall 5359, 3622.  
Telegrams: "AJAWB London."

**CELLON WORKS**

GEOFFREY WATSON 1917



**Firth's**  
"Speedicut" High-Speed Steel  
For turning Tools.

"Speedicut" Milling Cutters  
and Drills  
For all workshop purposes.

Thos. Firth & Sons Ltd.,  
Sheffield.

**VICKERS** LIMITED.

Contractors to the  
WAR OFFICE AND ADMIRALTY.

Aviation Department, Imperial Court,  
Basil Street, Knightsbridge, S.W.3.

Telephone No.—  
KENSINGTON 6810 (2 lines).



Telegraphic Address—  
VICKERFYTA, KNIGHTS, LONDON.



# AIRCRAFT FINANCE

## CURRENT TOPICS.

### "THE OUTLOOK."

Never, at any time within living memory, has the investor, as well as the trading manufacturer, stood in such need of expert guidance in their various financial transactions as at present. In the midst of conditions without parallel and with the future still obscure and threatening, it requires something more than even high business acumen to steer clear of the shoals and quicksands attaching to commercial companies and finance generally.

The war has brought about many changes and alterations in the old condition of things, but perhaps in nothing has the alteration been so great as in the important field of Financial Investment in the capitalisation of Manufacturing Industry. Time was when London was the centre pivot of the world's Money Markets, when all Banking Institutions and Stock Exchanges were influenced, if not absolutely controlled, by the Bank of England "rate" and the London Stock Exchange quotations.

Time was when practically every Foreign State was a debtor to the London Money Market, when every important issue of Foreign, Colonial, or Municipal Loan was first offered in this country, and when the English sovereign commanded a premium wherever Exchange existed.

To-day, instead of London financing American Corporations, Municipalities, and Public Utility Issues, the position is reversed. It is America that is financing Europe. Not only are we issuing British Government Loans in America, but New York to-day is financing the Governments of Europe direct, and quite recently placed loans for the Municipalities of Dublin, Paris, Bordeaux, Lyons, and Marseilles, these three latter to the tune of 20 millions of dollars each, while Chicago is lending a million sterling to China.

These facts speak louder than any words one can print. Such a complete change in the old order of things has taken place, seemingly without attracting the attention of the general investing public to the important issues involved. But when one comes to consider that the Chancellor of the Exchequer of Great Britain has now to find means of financing upwards of £40,000,000 of war expenditure every week, the only marvel is that he is able to finance such a stupendous sum without more disturbance of the financial equilibrium than that which has taken place.

These altered conditions make it imperative for every British Investor to re-consider his holdings. It has been authoritatively announced that the English sovereign to-day, compared with the pre-war standard, has a purchasing value of less than one-half, consequently, the capitalist, relying upon his dividends as his principal source of revenue, has to calculate upon a reduced purchasing value for his money. The trading manufacturer is affected in a like manner by having to pay a heavier rate of interest for the capital required in his business, and then there is the important point of what may be the contribution each individual will be called upon to contribute as his share to the War Chest. It is impossible for anyone to calculate with any precision what may be the cost of the present war to the individual, or to what extent each one may be forced to contribute by way of direct or indirect taxation. The only fact about which one may be quite certain is that the National Debt of the United Kingdom is daily growing, slowly and surely, mounting up to a stupendous figure, and however astute the Chancellor of the Exchequer may be to invent means to meet present expenditure, sooner or later he must devise projects, firstly, to pay the interest periodically on this enormous indebtedness; and, secondly, to provide a redemption fund with which to redeem the country's obligations.

Many attempts have been, and are being, made to ameliorate the present difficult situation. This is not the time to become pessimistic, but the wise man, with the responsibility and the care of others on his shoulders, will do well to seriously consider the present state of his financial investments and the outlook for the immediate future, and the trading manufacturer must also look ahead.

Lord Sydenham, writing upon this subject, so aptly says:—

"In the near future, the British people will be subjected to a test far more severe than any that their history records. Their fortitude, patience and calm judgment will be tried in the fire, and tremendous issues for themselves and for the

world depend upon decisions which will be determined mainly by the qualities, defying analysis or estimate, which lie at the root of national character."

### CAPITALISING RESERVES.

A correspondent writes asking what is the real effect of a company issuing fully-paid shares to its shareholders to represent the accumulation of profits placed by the directors of a company to reserve account. The most important change brought about is that the shareholder would hold a proportionately larger number of shares without in any way increasing the value of the investment.

Take the case of a certain motor firm which recently distributed one new share, as a bonus, for every share held and assuming that the profits earned by the company to remain the same in subsequent years, the resulting dividend to each shareholder, although holding double the number of shares, would be the same. In other words the market value of each member's holding should remain the same. The grave danger in such capital reorganisation schemes is that it provides opportunity to mislead the unsophisticated, who do not suspect that the share has thus been suddenly depreciated.

It must be borne in mind quite clearly that it does not follow because the nominal capital of the company has been doubled that the profit-earning power of the company has been increased in like proportion, even if at all.

Another important point is that distributions of this particular kind are a distinct loss to the National Revenue. At a time like the present it is indeed difficult to understand why the Treasury still gives its sanction to such new issues, as the amount of the super-tax lost by the distribution of capital in this form is considerable.

### THE SHARE REGISTER.

The importance of complying with the requirements of the Companies Acts as regards keeping the Share Register, or as it is sometimes called, the Register of Members, always available for inspection at the registered offices of the company, was demonstrated on Wednesday, February 27th, at Great Marlborough Street Police Court, when Mr. Robert Taylor, of 97, New Bond Street (who has lately associated himself with the Cowper-Coles Aircraft Co., Ltd., of Sunbury-on-Thames), was summoned under the Companies (Consolidation) Act, 1908, by Miss C. H. Watts, a shareholder in the Cowper-Coles Aircraft Co., Ltd., for refusing to allow her to inspect the share register of the company on her demand to do so.

The Defendant suggested that Plaintiff was private secretary to Mr. Sherard Cowper-Coles, with whom the Defendant Robert Taylor was at law. The solicitor for the Plaintiff pointed out the fact that an action was pending in connection with the same company against Mr. Robert Taylor which made it more desirable that she, as a shareholder, should have access to the share register.

Defendant's solicitor then put forward the defence that the share register was at his, the solicitor's, office at the time, but for this he was reprimanded by the Stipendiary magistrate and reminded that the books of a company should be kept at the registered office of that company, and in any case Defendant should have given a letter of authorisation to the Plaintiff to inspect the register at the solicitor's office.

In the result Mr. Robert Taylor was fined the maximum penalty under the Act with costs.

### AN IMPORTANT LEGAL DECISION.

The question of title and trade mark has always furnished, from time immemorial, ample grounds for legal contention, and the case of A. G. S. Manufacturing Company (Limited) v. Aeroplane General Sundries (Limited) is of such interest as to merit being recorded in full. Although Mr. Justice Neville declined to express any opinion as to the rights of the parties, he expressed himself very forcibly regarding the methods of the Defendants. The following appears in "The Times" law reports:—

In this action the Plaintiffs by their writ claimed an injunction to restrain the Defendants from carrying on business in or advertising or selling their goods under the name of A. G. S. (Limited) or any other name or title calculated to interfere with



the business of the Plaintiffs, or to pass off the good of the Defendants as the goods of the Plaintiffs.

On Feb. 22nd last the Plaintiffs moved for an interim injunction in the terms of their writ, and after considerable discussion the motion stood over for a week with a view to a settlement. As the parties had failed to come to an agreement, the motion now came on again.

Mr. Ward Coldridge, K.C., and Mr. Lavington, for the Plaintiffs, now asked for an order.

Mr. Jenkins, K.C. (Mr. Hodge with him), who appeared for the Defendants, said that although his clients adhered to the offer that they had made on the previous hearing, which had not been accepted, they submitted on the evidence that the advertisements complained of were perfectly justifiable, and they denied that they were trying to induce the public to apply to them as the Plaintiff company. No company or firm was entitled to use the letters A. G. S. as their own in this particular industry. The letters were part of the English language and did not constitute a fancy name, nor had they in a secondary sense come to mean the Plaintiff company.

Mr. Ward Coldridge and Mr. Lavington, for the Plaintiffs, were not called on to reply.

Mr. Justice Neville in delivering judgment said:—This is a curious case. Many people in the aeroplane industry know that the letters A. G. S. refer to a particular category of goods in which both the Plaintiffs and the Defendants deal, and whether the Plaintiffs will ultimately succeed in establishing their claim I do not decide now, and I express no opinion whatever upon it. But what I am dealing with now is, in my opinion, a dishonest attempt by the Defendants to obtain for themselves something that belongs to the Plaintiffs' title. There is no objection to the use of the letters A. G. S., but the Defendants in their advertisement are using them in every possible way to mean and to point to their company. In one advertisement they say that the letters A. G. S. "stand for the A. G. S. Company (Limited)." In another they say that the letters A. G. S. are the official name for their company. Those statements are lies, and it would be wrong to permit such advertisements to continue, and in my opinion the law does not prevent me from granting an injunction, which I now do, restraining the Defendants, their servants, or agents, from representing by advertisement or otherwise that the letters A. G. S. stand for or are otherwise the name of the Defendant company. Owing to the way in which the Defendants have behaved I make the Plaintiffs' costs of this motion their costs in any event.

[As no doubt the matter will be carried further I abstain from comment.—G.A.]

#### NEW COMPANIES.

*The files of the following new companies are available for inspection at Somerset House.*

**H. LLEWELLYN DENT, LTD.**—Private Company. Registered Feb. 18th. Capital, £50,000 in £1 shares (30,000 pref.). Constructional, electrical, mechanical, sanitary, civil, railway, consulting and general engineers, engineering and general agents, manufacturers and merchants, importers and exporters of and dealers in plant, machinery, engines, apparatus, implements and tools, founders, smelters, forgers, tub and boiler-makers, smiths, manufacturers of munitions, Government stores and requisites for naval, aerial and military purposes, etc.

The subscribers (each with one share) are:—

F. Young, 3, Love Lane, Wood Street, E.C., merchant.

H. Llewellyn Dent, Hadyn Park Road, Shepherd's Bush, W.12, engineer.

The first directors are:—F. Young, H. Llewellyn Dent.

F. Young is the nominee of City of London Equipments, Ltd.

Registered Office: Hadyn Park Works, Shepherd's Bush, W.12.

**EXPRESS ENGINEERING WORKS, LTD.**—Private Company. Registered Feb. 26th. Capital, £10,000 in £1 shares. Engineers, manufacturers of boilers, furnaces, manufacturers of aircraft and munitions, etc.

The subscribers (each with one share) are:—

R. R. Shankland, 89, Leadenhall Street, E.C., shipbroker.

A. W. Pickard, 7, Great St. Helens, E.C., shipbroker.

The first directors are to be appointed by the subscribers. Qualification, £1.

Registered Office: 7, Great St. Helens, E.C.

**WHITEHEAD MOTORS, LTD.**—Private Company. Registered Feb. 23rd. Capital, £2,000 in £1 shares. Manufacturers of and dealers in motors, internal combustion, aero and other engines, machines, devices or contrivances, motor-cars, lorries and vehicles, etc.

The subscribers (each with one share) are:—

J. A. Whitehead, Buccleuch House, Richmond, Surrey, aircraft builder.

L. D. Coupland, 61, Grena Road, Richmond, Surrey, secretary.

The first directors are:—J. A. Whitehead and L. D. Coupland. Remuneration of J. A. Whitehead, £400 per annum.

Registered Office: 61, Grena Road, Richmond, Surrey.

**FLIGHT MOTOR CO., LTD.**—Private Company. Registered March 1st. Capital, £250 in £1 shares. Motor agents, auto-

mobile engineers, manufacturers of and dealers in motor-cars, and vehicles, wagons, aeroplanes, etc.

The subscribers (each with one share) are:—

S. Michaels, 9, Crystal Palace Station Road, Upper Norwood, engineer.

E. A. Wade, Hollywood, 109, St. James Road, Croydon, advertising specialist.

The first directors are:—S. Michaels and E. A. Wade (both permanent). Qualification, £10.

#### MORTGAGES AND CHARGES.

**BEAUTY SCHOOL OF FLYING LTD.**—Registered Feb. 11th, 1918. Mortgages securing all moneys due or to become due to London Provincial and South Western Bank, Ltd., charged on certain contracts.

#### THE AFFAIRS OF THE WHITEHEAD COMPANY.

On Thursday, March 7th, Mr. J. A. Whitehead entertained a number of representatives to lunch at Buccleuch House, Richmond, when an announcement was made that Treasury consent had been granted for a new issue of one million pounds capital.

Mr. Whitehead said that he had contended with all kinds of opposition and various instances of misunderstanding, but he was convinced that he enjoyed the friendship of the Press.

Persons who were disposed to criticise his actions should remember that his position was one of great difficulty. Now all that was left for him was the talking.

He felt that the success of any business was determined by the survival of the fittest, and that if a man had a million pounds with which to work and could not keep it, he deserved to lose it. He gave the present output of the firm, but for obvious reasons it is not desirable to mention the figure in print.

Mr. Oldham, of Canada, a personal friend of Mr. Whitehead's, gave expression to his appreciation of Mr. Whitehead's life and work, and said that he was sure that from that day onwards he would be a different man. His allusion was not quite clear, but one assumes that he referred to the removal from Mr. Whitehead's mind of any further worry respecting a sufficient supply of capital with which to carry on the work of the firm.

One merely hopes that Mr. Whitehead will remember very clearly the distinction between a business man who is managing a million pounds of his own capital, which, as he said, he deserves to lose if he cannot keep it, and a manufacturer who is handling a million pounds of someone else's money. The former can adopt methods and conduct himself in a manner which the latter cannot permit himself as the trustee of the wealth of others.

#### SOME HOUSE AND WORKS MAGAZINES.

Hereafter follow short reviews of works magazines recently received:—

**THE AIRCRAFT RAG**, Feb., 1918 (Aircraft Manufacturing Co., Ltd., Hendon), complains of insufficient support on the part of its readers in the matter of literary contributions, and members of the different shops are earnestly invited to send in paragraphs of general interest, particularly of a personal character. Notes concerning engagements, marriages, and births are always welcome. The account of the fancy ball organised by the Entertainment Section Committee and the pen and ink sketches illustrating it are very amusing. The algebraical explanation of why an aeroplane flies, by Mr. G. Watts, A.C.G.I., B.Sc., has reached its sixth instalment, and, like Charlie's Aunt, is still running.

**AIRCRAFT SUPPLIES**, Feb. 27th (Aircraft Supplies Co., Ltd., 125, Long Acre, W.C.2), continues to demonstrate to aircraft constructors how aircraft components of all kinds may readily be acquired. An article by Mr. George H. Mansfield explains the uses of the factor, or middleman, in the scheme of things, and an interesting case is made out for this much-abused gentleman.

**THE B.P.**, Jan.-Feb. (Boulton and Paul, Ltd., Norwich), contains an interesting letter from Capt. H. G. Fiske, R.F.C., serving in Mesopotamia, describing the Garden of Eden and other places as viewed from the air. The technical puzzles, for which the "B.P." magazine is famous, preserve their very high standard. Some very interesting correspondence on the subject of piecework is printed.

**THE JOYSTICK**, Feb. (A. V. Roe and Co., Ltd., Manchester), records the departure of Mr. S. B. Riley, the firm's general manager, to America. He was felicitated at a social gathering of foremen at the Grand Hotel, Manchester, on Jan. 10th. The editor is glad to be able to congratulate Mr. A. V. Roe upon his appointment to the Order of the British Empire.

**THE OLYMPIAN**, Feb. (Blackburn Aeroplane and Motor Co., Ltd., Leeds), publishes the first instalment of an article by Mr. H. Goodyear on the progress of the Blackburn Company from the days of its early "pendulum" type monoplane in 1909.

**SAGECRAFT**, Feb. (Fredk. Sage and Co., Ltd., Peterborough), reports progress on the part of the Sage Sports Club, particularly in relation to football. A page of portraits of the firm's first directorate provides an interesting study of the types of business men of the old school, who were the founders of this very important enterprise.





# ARMSTRONG, WHITWORTH

## AIRCRAFT WORKS,

### NEWCASTLE ~ UPON ~ TYNE.



TELEPHONE :- 500 GOSFORTH.

TELEGRAMS :- ARMSTRONG AVIATION,  
NEWCASTLE ~ ON ~ TYNE.

# GWYNNE

LIMITED

CONTRACTORS TO H.M. ADMIRALTY AND WAR OFFICE.

SOLE LICENSEES AND MANUFACTURERS IN THE BRITISH EMPIRE  
OF THE

"CLERGET" PATENT AERO ENGINES.



WORKS & OFFICES: { CRISP ROAD, HAMMERSMITH, W.6. } LONDON.  
                          { CHURCH WHARF, CHISWICK, W.4. }

TELEPHONES: 1910 HAMMERSMITH (3 lines).  
                  1780 CHISWICK (3 lines).

TELEGRAMS: "GWYNNE, LONDON."

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





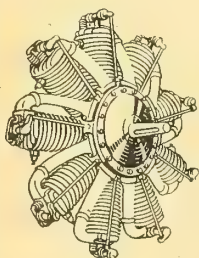
# Rotax

**ROTAX AEROPLANE FITTINGS and ROTAX MOTOR ACCESSORIES** -  
are both made with the same degree of accuracy and reliability that Government requirements call for and service conditions demand.

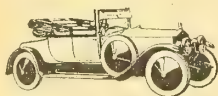
Special Catalogue of Aero Fittings just published sent on application. Specialities — Electrical Equipment, Streamline Wire and Fittings — Brass and Gunmetal Fittings, etc., etc.

**The ROTAX MOTOR ACCESSORIES Co., Ltd.**  
HEAD OFFICES—  
Rotax Works, Willesden Junction, N.W. 10

## F. W. BERWICK & CO., LIMITED.

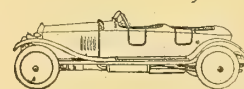


**AEROPLANE & AERO  
Engine Manufacturers  
TO THE AIR BOARD**



**PARK ROYAL, LONDON, N.W.10.**

Telephone: 2493 Willesden (5 lines). Telegrams: "Berworks, Harles, London."

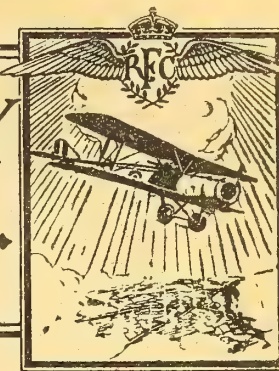


*Proprietors and Manufacturers of the Sizaire-Berwick Car.*





# NAVAL *and* MILITARY • AERONAUTICS •



## FROM THE "LONDON GAZETTE."

WAR OFFICE, March 5th.

**REGULAR FORCES.—ESTABLISHMENTS.—**Equip. Officers, 1st Cl.—Lt. R. E. Reid, Spec. Res., from the 2nd Cl., and to be temp. Capt. while so empld., Feb. 10th.

**MEMORANDUM.—**Serjt.-Maj. H. J. Dann, from R.F.C., to be Sec. Lt., Nov. 16th, 1917. \* \* \*

The King has been pleased to confer the following rewards for gallantry and distinguished service in the field. The acts of gallantry for which the decorations have been awarded will be announced in the "London Gazette" as early as practicable:—

### DISTINGUISHED SERVICE ORDER

Temp. Sec. Lt. (temp. Capt.) B. E. Baker, M.C., Gen. List and R.F.C.

Temp. Capt. M. B. Frew, M.C., Gen. List and R.F.C.

Temp. Capt. A. H. Peck, M.C., Gen. List and R.F.C.

### THE MILITARY CROSS.

Lt. (temp. Capt.) D. C. Bell, Middx. R. and R.F.C.

Sec. Lt. R. J. Brownell, M.M., R.F.C., Spec. Res.

Temp. Sec. Lt. P. Carpenter, Gen. List and R.F.C.

Sec. Lt. (temp. Capt.) M. E. Gonne, R. Fus. and R.F.C.

Temp. Sec. Lt. F. C. Gorrington, Gen. List and R.F.C.

Sec. Lt. J. S. Green, Gen. List and R.F.C.

Temp. Sec. Lt. F. Hobson, Gen. List and R.F.C.

Temp. Sec. Lt. G. R. Howsam, Gen. List and R.F.C.

Lt. (temp. Capt.) P. D. Robinson, R.F.C., Spec. Res.

Temp. Sec. Lt. (temp. Capt.) B. J. Silly, Gen. List and R.F.C.

Sec. Lt. A. Wald, R.F.C., Spec. Res.

### CANADIAN FORCE.

Lt. F. R. McCall, Infy. and R.F.C. \* \* \*

The King has been pleased to approve of the award of the Military Medal to the following ladies of the Nursing Service:—

A./Sister Maud Alice Abraham, Civil Hpl. Res.; A./Sister Florence Broome, Civil Hpl. Res.; A./Sister Anna Georgina Boyd, A.R.R.C., Q.A.I.M.N.S. (R.).—For bravery, coolness, and conspicuous devotion displayed in the performances of their duties on occasions when the Casualty Clearing Station has been under hostile shell fire and bombed by enemy aircraft.

### AMENDMENTS.

The following are the correct descriptions of officers upon whom rewards have recently been conferred:—

Lt. F. G. Huxley, M.C., Aust. F.C. (M.C., gazetted Feb. 4th).

Capt. R. C. Phillips, M.C., Aust. F.C. (M.C., gazetted Feb. 4th).

WAR OFFICE, March 6th.

**SPECIAL RESERVE OF OFFICERS.—SUPPLEMENTARY TO REGULAR CORPS.—R.F.C.—MIL. WING.—**Lt. (temp. Capt.) A. W. Briggs is removed from the Service for absence without leave (Feb. 15th). \* \* \*

The King has been pleased to award the Distinguished Conduct Medal to the following for gallantry and distinguished service in the field:—

1753 Flt. Serjt. G. A. F. Gibson, R.F.C. (Queen's Park, London, W.).

4965 1st Cl. Air Mech. S. Hall, R.F.C. (Newton Heath, Manchester).

769 Serjt. T. F. Stephenson, R.F.C. (Peterboro').

WAR OFFICE, March 7th.

**REGULAR FORCES.—R.F.C.—MIL. WING.—**Gen. List.—2nd Cl. Air Mech. W. W. Fyfe, from R.F.C., to be temp. Sec. Lt. (on prob.), Jan. 15th.

**OVERSEA CONTINGENTS.—CANADA.—**Central Ont. R.—Temp. Capt. G. H. S. Campbell is seed. for duty with the R.F.C., July 1st, 1917. \* \* \*

With reference to the awards conferred as announced in the "London Gazette" dated October 18th, 1917, the following are

the statements of service for which the decorations were conferred:—

### A BAR TO THE MILITARY CROSS.

Sec. Lt. L. M. BARLOW, M.C., R.F.C., Spec. Res.

For conspicuous gallantry and devotion to duty in aerial combats over a considerable period, during the course of which he destroyed six enemy machines and drove down three out of control. He has taken part in over 60 offensive patrols, of which he led 10. His gallantry and skill have been most marked and consistent. (M.C. gazetted Aug. 25th, 1917.)

Lt. (temp. Capt.) C. F. COLLETT, M.C., R.F.C., Spec. Res. and Gen. List.

For conspicuous gallantry and devotion to duty in leading offensive patrols against enemy aircraft. Within a period of three weeks he successfully engaged and destroyed five enemy machines (three of them in one day), attacking them from low altitudes with the greatest dash and determination. His brilliant example was a continual source of inspiration to the squadron in which he served. (M.C. gazetted Sept. 26th, 1917.)

Temp. Capt. P. J. V. LAVARACK, M.C., Gen. List and R.F.C.

When attacked on artillery patrol by eight enemy aircraft he succeeded in driving down one machine, the rest being driven off east. Later, he drove off three scouts badly hit, which could not be followed owing to the clouds. In the last month he has fought and driven off enemy aircraft on seven occasions, and afterwards completed his work. (M.C. gazetted May 26th, 1917.)

Temp. Sec. Lt. (temp. Capt.) E. MANNOCK, M.C., R.E., and R.F.C.

He has destroyed several hostile machines and driven others down out of control. On one occasion he attacked a formation of five enemy machines single-handed, and shot one down out of control. On another occasion, while engaged with an enemy machine, he was attacked by two others, one of which he forced to the ground. He has consistently shown great courage and initiative. (M.C. gazetted Sept. 17th, 1917.)

Sec. Lt. (temp. Capt.) D. F. STEVENSON, M.C., Yeo. and R.F.C.

For conspicuous gallantry and devotion to duty in obtaining photographs of a raid carried out by our troops which necessitated his flying through our barrage at a height of less than 1,000 ft. On another occasion he brought down a hostile machine. He was under heavy fire from the ground the whole time, and was eventually forced to land behind our lines owing to his petrol tank being shot through. (M.C. gazetted Sept. 17th, 1917.)

### THE MILITARY CROSS.

Temp. Capt. R. N. G. ATKINSON, Gen. List and R.F.C.

This officer has done a large amount of successful artillery work, has taken part in many night bombing raids, and has continually distinguished himself by his fearlessness and determination in descending to low altitudes in order to attack hostile infantry and machine guns. On one occasion, also, he successfully attacked and drove down a hostile balloon.

Sec. Lt. J. A. BORET, R.W. Surr. R. and R.F.C.

For conspicuous gallantry and devotion to duty on many occasions. He has taken part in 41 night bombing raids, many of which were carried out at a very low altitude and in bad weather. He has successfully inflicted considerable damage upon his objectives.

Temp. Sec. Lt. C. W. CUDEMORE, Gen. List and R.F.C.

For conspicuous gallantry and devotion to duty in attacking enemy aircraft and kite balloons. He has brought down at least three enemy machines and three kite balloons, and has taken part in numerous other engagements. He has consistently set a very fine example of pluck and determination in all his attacks.

Sec. Lt. (Temp. Lt.) J. DIAMOND, K.O.S.B. (Spec. Res. and R.F.C.).

For conspicuous gallantry and devotion to duty in co-operating with our artillery, often under most adverse conditions,



On two occasions he ranged our siege batteries on hostile battery positions, causing numerous fires and explosions.

Temp. Sec. Lt. M. B. FREW, Gen. List and R.F.C.

For conspicuous gallantry and devotion to duty on patrol, showing a fine offensive spirit in many combats. He has shot down five enemy aeroplanes, on one occasion leading his formation to attack 22 Albatros scouts, and himself shooting one down.

Temp. Sec. Lt. R. E. G. FULLJAMES, Gen. List and R.F.C.

For conspicuous gallantry and devotion to duty during six months' continuous work with the artillery. During a battle he carried out four most valuable reconnaissances, bringing back information of our front line and directing artillery on to enemy infantry and the farm buildings where they were concentrating. During 19 days he had only one failure in 12 flights.

Temp. Lt. H. D. HARMAN, Gen. List and R.F.C.

He has taken part in 38 night bombing raids, and has successfully attacked aerodromes, doing considerable damage. He has invariably displayed great gallantry and determination.

Lt. S. B. HORN, D.G. and R.F.C.

He has destroyed several hostile machines and driven down others out of control. On one occasion he attacked alone four enemy aircraft, shooting one down completely out of control. He has twice co-operated with an infantry attack, diving to a very low altitude. He has shown great skill and gallantry on all occasions.

Temp. Sec. Lt. H. A. JONES, attd. Wilts R. and R.F.C.

When returning from a bombing raid the machine in which he was observer was attacked by four enemy aeroplanes. One was driven down, and though his pilot was severely wounded he continued the fight until his gun was put out of action by enemy fire. He showed great courage and determination.

Capt. G. J. C. MAXWELL, Yeo. and R.F.C.

He has taken part in 43 offensive patrols, in 14 of which he acted as leader. He has destroyed at least three enemy aircraft, and driven down nine others completely out of control. He has consistently shown great skill in aerial combats, and his fearlessness and fine offensive spirit have been a splendid example to others.

Temp. Sec. Lt. K. K. MUSPRATT, Gen. List and R.F.C.

He showed great initiative throughout the offensive operations, and seldom failed to become engaged with enemy aircraft when on offensive patrol. He destroyed several hostile machines. He took part in over 40 offensive patrols, the majority of which entailed very severe fighting at low altitudes under heavy fire, and he set a magnificent example by his skill, gallantry, and initiative.

Sec. Lt. A. C. T. PERKINS, R.G.A., Spec. Res., attd. R.F.C.

The machine in which he was an observer came into collision with another when he was at a height of 4,000 ft., and had its right-hand bottom plane so badly damaged that it got into a spinning nose-dive. Seeing this, he immediately climbed to the outer bay of the left-hand plane, and by his weight there enabled his pilot to right his machine and to land without further damage.

Temp. Sec. Lt. W. M. PIERCE, Gen. List and R.F.C.

Whilst on artillery patrol his machine was attacked by a hostile scout. Although he was wounded by the first burst of hostile fire, he continued to work his gun, and succeeded in driving off the enemy machine, which is believed to have been severely damaged. When taken to the C.C.S. he insisted on being sent to his squadron, in order to make a reconnaissance report on movement behind the enemy's lines. After doing this he was taken back to the C.C.S., where he was operated on and the bullet extracted. This officer has proved himself a most reliable observer. He has done consistent good work, and many of his reports have been of the greatest value.

Temp. Sec. Lt. (Temp. Capt.) W. J. TEMPEST, D.S.O., Gen. List and R.F.C.

For conspicuous gallantry and devotion to duty on many occasions. He has successfully bombed railway sidings and aerodromes, often in misty and cloudy weather and at a low altitude, causing much damage to his objectives. On one occasion he descended to a very low altitude and dropped bombs on two moving trains, causing them both to be derailed. This officer has taken part in 34 night bombing raids.

Sec. Lt. (Temp. Lt.) F. W. H. THOMAS, Yeo. and R.F.C.

When returning from a bombing raid the machine in which he was observer was attacked by four enemy aeroplanes. One was driven down, and though his pilot was severely wounded he continued to fight until his gun was put out of action by enemy fire. He showed great courage and determination.

Capt. C. T. VACHELL, Mon. R. and R.F.C.

He performed continuous good work on contact patrols and reconnaissances, flying at a low altitude. On one occasion in a very strong gale, flying low, he obtained information of the greatest importance.

Sec. Lt. (Temp. Lt.) L. WALMSLEY, E. York. R., Spec. Res., and R.F.C.

While acting as observer during a flight over enemy lines the petrol pipe burst. With great coolness he attempted to stop the leak in spite of great danger from fire, eventually enabling the pilot to land safely in our own lines. He has consistently done very fine work throughout.

The following are among those mentioned in a dispatch dated May 30th, 1917, which has been received by the Secretary of State for War from Maj.-Gen. A. R. Hoskins, C.M.G., D.S.O., late Commanding-in-Chief, East Africa Force:—

ROYAL NAVAL AIR SERVICE.

Mathias, C.P.O., 2nd Gr., E., O.N. M.6508; Seager, Air Mech., 2nd Gr., J. H., O.N. F7818.

ROYAL FLYING CORPS.

Mossop, Sec. Lt. M.C., Spec. Res.; Osman, Temp. Lt. F. L.; Andrews, No. Z.212 Serjt. E. A.; Atkins, No. Z.252 Cpl. (actg. Serjt.) H.; Geater, No. Z.194 Serjt. (actg. Flt. Serjt.) A. R.; Parsons, No. Z.211 Cpl. R. S. V.; Sim, No. Z.180 Serjt. T.; Solomons, No. Z.144 Serjt. (Flt. Serjt.) A. L.

The following are among those mentioned in a dispatch dated Oct. 11th, 1917, which has been received from the Secretary of State for War from Lt.-Gen. J. L. Van Deventer, K.C.B., Commanding-in-Chief, East Africa Force:—

ROYAL FLYING CORPS.

Carey-Thomas, Temp. Capt. W. W., M.C.; Kennedy, Temp. Lt. A. E.; Lovemore, Sec. Lt. R. B., R. Fus.; Reynolds, Temp. Sec. Lt. A. E., Gen. List; Smith, Sec. Lt. F. C., Spec. Res.; Wallace, Temp. Maj. G. P., D.S.O.; Walmsley, Temp. Lt. L., M.C., E. Yorks. R.

Barnes, No. Z.323 Cpl. A. W.; Blake, No. Z.123 1st Cl. Air Mech. (actg. Cpl. H. H.); Husin, No. Z.134 1st Cl. Air Mech. (actg. Cpl.) W. H.; Paré, No. Z.261 1st Cl. Air Mech. (actg. Cpl.) L. J. D.; Smith, No. Z.294 Serjt. E. C.; Walker, No. Z.184 1st Cl. Air Mech. (actg. Cpl.) C.

WAR OFFICE, March 8th.

REGULAR FORCES—ESTABLISHMENTS—R.F.C.—MIL. WING.—Flt. Comdrs.—From Flying Officers (Jan. 1st):—Temp. Capt. W. H. de W. Waller, Gen. List. And to be temp. Capt. whilst so empld.:—Lt. P. C. Purser, M.C., A.S.C., T.F.; temp. Lt. C. H. Keefe, Gen. List (since killed); Lt. J. T. Morgan, R. Welsh Fus.; temp. Sec. Lt. (temp. Lt.) D. R. G. Mackay, attd. Arg. and Suth'd Highrs., and to be transferred to R.F.C. Gen. List; temp. Sec. Lt. T. Gran, Gen. List; temp. Sec. Lt. L. W. Barney, Gen. List; temp. Sec. Lt. H. J. Edwards, Gen. List.

Gen. List.—1st Cl. Air Mech. S. V. Cowell, from R.F.C., to be temp. Sec. Lt., Oct. 23rd, 1917.

The King has been pleased to approve of the following reward for distinguished service in the Field. Dated Jan. 1st, 1918:—

THE MILITARY CROSS.

Capt. W. H. L. O'NEILL, Sikhs, I.A., and R.F.C.

The King has been pleased to award the Albert medal to Flt. Lt. Victor Albert Watson, R.N., and the Albert medal in gold to Air Mech., 1st Gr., Harold Victor Robinson and Boy Mech. Eric Edward Steere, in recognition of their heroic conduct in the following circumstances:—

On the occasion of an accident to one of his Majesty's airships, which resulted in a fire breaking out on board her, Flt. Lt. Watson, the senior officer on the spot, immediately rushed up to the car of the airship under the impression that one of the crew was still in it, although he was well aware that there were heavy bombs, attached to the airship, which could not be removed owing to the nearness of the fire and were liable to explode at any moment on account of the heat. Having satisfied himself that there was no one in the car, he turned away to render assistance elsewhere. At that moment one of the bombs exploded, and a portion of it shattered his right arm at the elbow. It was necessary to amputate the limb almost immediately.

Air Mech. H. V. Robinson and Boy Mech. E. E. Steere, on the occasion of an accident to one of his Majesty's airships which caused a fire to break out on board her, approached the burning airship without hesitation, extricated the pilot and two members of the crew, all of whom were seriously injured, and then unclipped the bombs from the burning car and carried them out of reach of the fire. As the bombs were surrounded by flames, and were so hot that they scorched the men's hands as they carried them, Robinson and Steere must have expected that the bombs would explode.

WAR OFFICE, March 9th.

REGULAR FORCES—ESTABLISHMENTS—R.F.C.—MIL. WING.—Flt. Comdr.—L. R. Dodds, Cent. Ontario R., from a Flying Officer, and to be temp. Capt. whilst so empld., Feb. 10th.

SCHOOLS OF INSTR.—SCHOOLS OF TECHNICAL TRAINING.—Co. Comdr. (graded as an Equipt. Officer, 2nd Cl.).—Lt. H. D. Ashton, Yeo., T.F., to be secnd. and to be temp. Capt. (without pay or allowances of that rank) while so empld., Feb. 6th.

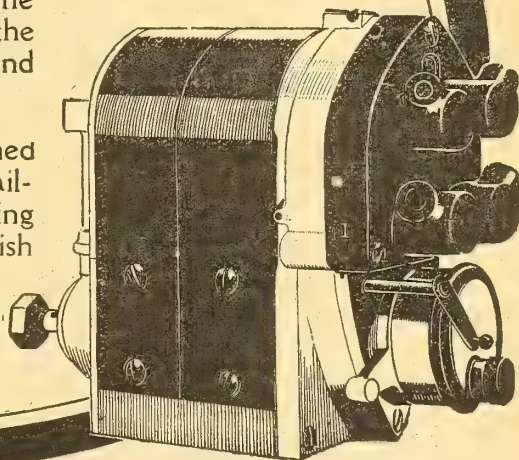




## The B.T.H. Magneto

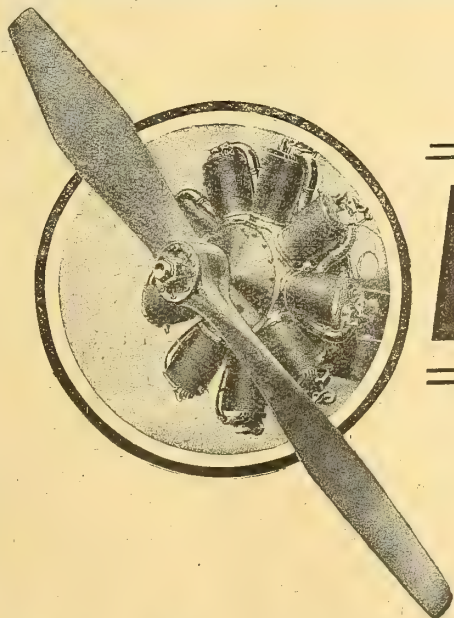
embodies all the good features of former magnetos with added improvements based on our unrivalled manufacturing experience in the production of Electrical Apparatus of the highest quality for traction, power, and lighting purposes.

Although our present output is requisitioned for war purposes, supplies will be available after the war for those desiring magnetos of the highest quality, of British manufacture, and, of proved reliability in service.



**THE BRITISH THOMSON-HOUSTON CO. LTD.**  
Electrical Engineers & Manufacturers.  
Lower Ford Street, Coventry, England.

Member of the British Ignition Apparatus Association.



## AERO ENGINES



**W. H. ALLEN, SON & CO. L<sup>TD</sup>.**  
**QUEEN'S ENGINEERING WORKS, BEDFORD,**  
**ENGLAND.**



Gen. List.—Temp. Capt. H. Ansell, Garr. Battn., Essex R., is transferred, Jan. 16th.

#### WAR OFFICE, March 11th.

**REGULAR FORCES—ESTABLISHMENTS—R.F.C.—MIL. WING.**—Special Appts.—(Graded as Staff Cpts. whilst empld. as Sqdn. Comdrs.) :—Capt. W. R. Hoare, Hamps. R., T.F., and to be sec'd.; temp. Capt. H. W. R. Haselhurst, attd. Northd. Fus., and to be transfd. to R.F.C. Gen. List, Oct. 8th, 1917.

Flt. Comdrs.—From Flying Officers, and to be temp. Cpts. whilst so empld. :—Lt. E. T. Owles, M.C., R. Ir. Fus., Spec. Res.; Lt. A. Mann, M.C., A.S.C., T.F., Dec. 5th, 1917.

Asst. Instrs. in Gunnery.—(Graded as Equipt. Officers, 3rd Cl.)—Capt. R. J. Wallace, R. Scots, T.F., and to be sec'd.; Capt. E. F. Ambler, Lond. R., T.F., from a Flying Officer; Lt. T. Parker, North'n R., Spec. Res., from M.G. Corps; temp. Lt. S. D. Pegram, M.G. Corps, and to be transfd. to R.F.C. Gen. List; temp. Lt. H. B. Hurst, Gen. List, from a Flying Officer; Lt. R. G. Morrison, Hrs., and to be sec'd.; Lt. A. R. Mutter, Wilts R., T.F., and to be sec'd.; Lt. E. W. Hallam, Yeo., T.F., from a Flying Officer; Sec. Lt. (temp. Lt.) V. Hermann, Lt. W. R. Munro, Gen. List, from a Flying Officer; temp. Sec. Lt. R. E. Towler, Gen. List, from a Flying Officer, Feb. 14th. Temp. Sec. Lts. (on prob.), Gen. List, and to be confirmed in their rank :—G. Hammersley, G. L. Chesterton, A. H. Knight.

Spec. Appt.—(Graded as a Park Comdr.)—Capt. A. A. Nathan. Yeo., T.F., from an Instr. (graded as an Equipt. Officer, 1st Cl.) at a School of Mil. Aeronautics, and to be temp. Maj. whilst so empld., Jan. 15th.

**SCHOOLS OF INSTRN.—SCHOOL OF TECHNICAL TRAINING.—Co. Comdrs.**—(Graded as Equipt. Officers, 2nd Cl.)—Lt. F. B. Bayly, A. Cyclist Corps, to be sec'd., and to be temp. Capt. (without the pay or allowances of that rank) while so empld., Feb. 13th. The initials of Lt. E. G. Etheridge, Suff. R., T.F., are as now described and not as in the "Gazette" of Jan. 15th.

Gen. List.—Lt. V. A. Royle to be temp. Capt., Feb. 3rd.

\* \* \*

The following are among the Decorations and Medals awarded by the Allied Powers at various dates to the British Forces for distinguished services rendered during the course of the campaign. The King has given unrestricted permission in all cases to wear the Decorations and Medals in question :—

CONFERRED BY THE KING OF THE BELGIANS.

CROIX DE GUERRE.

Maj. J. L. Baird, C.M.G., D.S.O., M.P., Yeo.  
Lt. (temp. Maj.) J. E. A. Baldwin, Hrs. and R.F.C.  
Temp. Capt. N. A. Bolton, Spec. List and R.F.C.  
Lt. (temp. Capt.) C. M. B. Chapman, M.C., E. Kent R. and R.F.C.  
Lt. (temp. Capt.) J. M. Child, Manch. R. and R.F.C.  
Temp. Capt. S. Cockerell, Gen. List and R.F.C.  
Temp. Capt. J. H. O. Jones, Spec. List and R.F.C.  
Lt. (temp. Maj.) J. C. Russell, R.E. and R.F.C.  
Lt. (temp. Capt.) J. C. Slessor, M.C., R.F.C. (S.R.).  
Sec. Lt. (temp. Maj.) L. A. Tilney, M.C., R.H. Gds. and R.F.C.  
Maj.-Gen. Sir H. M. Trenchard, K.C.B., D.S.O.  
Lt. F. Tymms, M.C., S. Lanc. R. and R.F.C.  
Temp. Capt. W. A. Wright, Gen. List and R.F.C.

#### FROM THE COURT CIRCULAR.

BUCKINGHAM PALACE, March 6th.

The King held an Investiture of the Most Excellent Order of the British Empire at 10.30 o'clock this morning.

The following were severally introduced into the presence of His Majesty, when The King invested them with the Insignia of the respective Divisions of the Order into which they have been admitted :—

Comdr., Wing-Capt. EDWARD MASTERMAN, R.N.A.S.  
Membr., Flt. Lt. LEON KILLMAYER, R.N.

BUCKINGHAM PALACE, March 8th.

Lieut. The Prince Albert, R.N., has arrived at the Palace.

BUCKINGHAM PALACE, March 9th.

The following officers had the honour of being received by The King this morning, when his Majesty conferred decorations as follows :—

THE MILITARY CROSS AND BAR.—Maj. George Reid, Arg. and Suthd. Highrs. and R.F.C.

THE MILITARY CROSS.—Maj. Edward Rice, R.F.C.; Capt. John Barnett, Oxford and Bucks L.I., attd. R.F.C.; Capt. Charles Blayney, R.F.C.; Capt. Roy Philipps, A.F.C.; Capt. Archibald Reeves, R.F.C.; Capt. Bernard Rice, Gen. List and R.F.C.; Capt. Percy Whittet, R.F.C.; Capt. Hervey Whitworth, Dorset R. and R.F.C.; Lt. Reginald Brett, R.F.C.; Lt. Henry Jones, R.F.C.; Lt. Reginald Larkin, R.F.C.; Lt. William Price, R. Warwick. R. and R.F.C., Sec. Lt. Graham Judge, Loyal N. Lancs. R., attd. R.F.C.; Sec. Lt. Edmund Williams, R. Munster Fus. and R.F.C.

#### NAVAL.

ADMIRALTY COMMUNIQUÉS.

MARCH 10th.—A bombing raid was carried out yesterday (Saturday) by naval aircraft on billets and railway sidings at St.

Pierre Capelle (east of Nieuport). Direct hits were observed on three sheds and a fire started. Many bombs were dropped.

Bombs were also dropped on a large hostile machine which was seen to have made a forced landing. No direct hits were observed. Several soldiers and motors in the vicinity were subjected to machine-gun fire.

On the return journey our formation was attacked, and one enemy machine was brought down in flames.

All our machines returned safely.

MARCH 11th.—A bombing raid was carried out by naval aircraft on Engel aerodrome and Engel dump, two fires being started.

In aerial fighting three enemy aircraft were destroyed and four driven down out of control.

All our machines returned safely.

#### TUE. CASUALTY LIST.

Reported March 7th.

KILLED (ACCIDENTALLY).—Arrowsmith, R. G., Aircraftman, 1st Cl. 45199; Brady, W. C. E., Aircraftman, 1st Cl. F 45201.

Reported March 8th.

DROWNED.—Rowley, Obsr. Sub-Lt. B. G., R.N.

PREVIOUSLY REPORTED MISSING (FEARED DROWNED), NOW PRESUMED DROWNED.—Larter, Flt. Sub-Lt. N. L., R.N.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED.—Horner, Flt. Comdr. (Actg. Lt., R.N.) W. F., R.N.

Day, Flt. Sub-Lt. H., D.S.C., R.N.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER.—Youens, Flt. Sub-Lt. H. St. J. E., R.N.

Reported March 11th.

ACCIDENTALLY KILLED.—Cross, Flt. Sub-Lt. W. N., R.N.

PREVIOUSLY REPORTED MISSING (FEARED DROWNED), NOW PRESUMED DROWNED.—Cressman, Flt. Sub-Lt. F. C., R.N.

#### PERSONAL NOTICES.

MARRIAGE.

SIMMONS—MYERS.—On the 7th inst., at the New West End Synagogue, Chief P.O. Samuel Simmons, R.N.A.S., son of Mr. and Mrs. Lewis Simmons, 35, Glimpton Road, Brondesbury, was married to Letty, eldest daughter of Mr. and Mrs. Dick Myers, 30, Kensington Park Road, W., by the Rev. E. Levine, assisted by the Rev. Prince.

BIRTHS.

GROSVENOR.—Lady Edward Grosvenor, wife of Flt. Comdr. Edward Grosvenor, R.N., gave birth to a daughter on Monday, March 4th, at 30, Upper Brook Street, W.

PORTE.—On March 4th, at 8, Norfolk Terrace, Brighton, the wife of Wing Comdr. J. C. Porte, R.N., of a son (still-born).

#### MILITARY.

G.H.Q. COMMUNIQUÉS.

MARCH 6th, 9.25 p.m.—After two days of wind and rain, on the afternoon of the 5th inst. the weather cleared slightly.

Our aeroplanes observed for the artillery and carried out a few reconnaissances.

Bombs were dropped by us on the railway sidings at Mouscron (north-east of Lille) and on targets near the enemy's lines.

In air fighting two hostile machines were brought down and one other was driven down out of control.

One of our machines is missing.

After dark Ingelmunster railway station and a hostile aerodrome north-east of St. Quentin were heavily bombed by our machines, all of which returned.

MARCH 7th, 9.20 p.m.—The fine weather on the 6th inst. led to great aerial activity on both sides.

Our aeroplanes reconnoitred all parts of the front, and took a great many photographs of the enemy's forward and back areas.

Over 400 bombs were dropped on hostile billets and railway sidings, and several thousand rounds were fired from the air from machine-guns at parties of German infantry, hostile batteries in action, and transport on roads.

Continuous fighting took place between our scouts and the enemy's machines, which persistently attacked our bombing and artillery machines. Ten German aeroplanes were brought down, and 10 others driven down out of control.

Three of our machines are missing.

After dark, a thick mist developed and prevented much night flying being done. A few bombs, however, were dropped on German aerodromes close to Metz.

All our machines returned.

MARCH 8th, 9.55 p.m.—Although the weather on the 7th instant was fine, the thick haze interfered with flying. None the less, our aeroplanes dropped on various targets three and a half tons of bombs, one ton of which was dropped on a hostile aerodrome east of St. Quentin.

A few fights took place in which one German machine was brought down.

None of our aeroplanes is missing.





## Your Despatch - Rider

Needs a pair of 'Triplex' Safety Goggles.



Price :  
**7/6**  
Per Pair

## 'TRIPLEX' SAFETY GLASS

cannot 'fly' or splinter even if badly smashed and is a great protection against shrapnel. Remember 'Triplex' is saving the sight and lives of Pilots, Despatch-riders and M-T. Drivers overseas by reason of its intrinsic merit.

Send 'him' a pair of 'Triplex' Goggles to-day.

THE 'TRIPLEX' SAFETY GLASS CO., LTD.

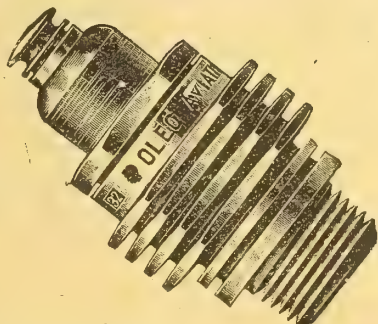
(Reginald Delpech, Managing Director)

1, Albemarle St., Piccadilly, London. W.1.

Telephone :—1340 Regent.

Telegrams :—"Shatterlys, Piccy, London."

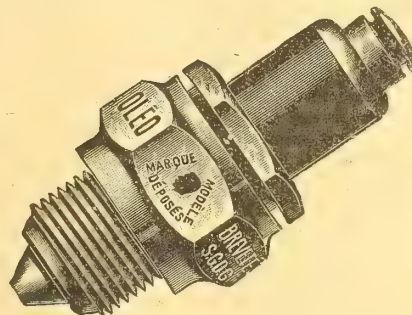
W



TYPE No. 32.



"The Smile of Success,"



TYPE No. 27G.

OLEO were the first Aero Plugs ever made.  
OLEO won the Aero Grand Prix SIX TIMES in succession.  
OLEO Plugs have been supplied to the Government since 1913.  
OLEO Aero Plugs have the "Largest Sale in the World."  
OLEO Plugs have won over £30,000 in prizes.  
OLEO Plugs were the first to Loop the Loop.  
OLEO Plugs were the first to Cross the Alps.  
OLEO Plugs are supplied to NINE Governments.

# OLEO

## PLUGS

LEO RIPAULT & CO.  
64, POLAND ST. LONDON, W.

TELEGRAMS: RIPAULT-REC. LONDON. TELEPHONE: GERRARD 7753

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



During the night of the 7th-8th instant our night bombing machines attacked the railway stations of Cambrai and Cusigny (south-east of Cambrai), in addition to billets and active hostile batteries, dropping a total of five tons of bombs.

All our machines returned.

MARCH 9th, 9.40 p.m.—Great aerial activity prevailed on the 8th inst. Work in conjunction with the artillery reconnaissances, photography, and bombing was carried out incessantly by our aeroplanes.

Over 400 bombs were dropped on the enemy's ammunition dumps and sidings at Menin, Busigny, and Guise, east of St. Quentin, in spite of the most determined attacks made by the enemy's scouts against our bombing machines.

In air fighting twelve hostile aeroplanes were brought down, and 10 others were driven down out of control. Another hostile machine was shot down by anti-aircraft gunfire.

Three of our aeroplanes are missing.

After dark the greater part of the front was enveloped in mist, but in one sector our night-flying machines dropped 24 heavy bombs and 48 lighter bombs on the ammunition dump and railway sidings at Fresnoy, north-east of St. Quentin.

All our machines returned.

At midday on the 9th inst. the railway sidings and factories at Mainz (at the junction of the Rivers Rhine and Main), in Germany, were bombed by our aeroplanes with good results.

Well over a ton of bombs were dropped, and bursts were seen on and around the barracks, on the railway sidings, and on a factory. A large fire was started.

All our machines returned.

MARCH 10th, 9.30 p.m.—The aerial activity of the last few days continued on the 9th inst. Several long-distance reconnaissances were successfully completed by our aeroplanes, and many photographs were taken. Observation for artillery was carried out all day.

Six hundred bombs were dropped by us on the enemy's ammunition dumps, billets, and aerodromes and on an important railway centre north-east of S. Quentin.

In particular a most successful attack was carried out at a low height by a large number of our machines against three hostile aerodromes. Bombs were dropped from an average height of 400 feet, and at each of the aerodromes direct hits were obtained on hangars and on machines in the open.

While returning from this attack our pilots flew at a height of 100 feet, firing on favourable targets on the ground with their machine-guns, and causing casualties and much confusion among the enemy.

In one case horse transport on the road was engaged, with the result that some of the wagons were upset into the ditch. In another horses in an orchard were stampeded. A company of German infantry was scattered in all directions, and a group of officers on horseback dispersed.

The fighting in the air was heavy. Ten hostile machines were brought down and ten others driven down out of control. A German observation balloon was also destroyed.

Two of our machines are missing.

On the 10th inst. Germany was again bombed by our aeroplanes in broad daylight. On this occasion the Daimler Motor Works at Stuttgart were attacked, and over one and a quarter tons of bombs were dropped by us.

Several bursts were observed on the railway station, where a stationary train was hit and set on fire. Three bursts were seen on the munition factory south-east of the town, and other bursts on the Daimler Works and on buildings around them.

Hostile machines made a weak attempt to attack the formation over the objective, but withdrew on being attacked.

All our machines returned except one, which evidently had engine trouble and went down under control just before recrossing the lines on the homeward journey.

MARCH 11th, 9.35 p.m.—On the 10th instant the thick haze rendered work by our aeroplanes in conjunction with the artillery almost impossible. Several reconnaissances, however, were carried out by us, and over 400 bombs were dropped.

Amongst other targets, Menin, Roulers, Ledeghem, Cambrai, and Solesmes (east of Cambrai) railway stations were bombed by our machines.

Three hostile observation balloons were destroyed by our aeroplanes, and five German machines were brought down in air fighting, in addition to seven others driven down out of control. One low-flying hostile machine was shot down by our infantry.

Four of our aeroplanes are missing.

#### WAR OFFICE COMMUNIQUÉS.

MARCH 6th.—The G.O.C. Italy reports:—

Since last report the weather has been dull, with flying only possible on one day, in which we destroyed three hostile machines. Captured airmen admit freely the Allied superiority in the air, and say that great damage has been done to their aerodromes and machines, especially during the past two months.

MARCH 8th.—The G.O.C. Palestine reports:—

On March 4th successful bombing raids were undertaken

against the railway and aerodrome near El Kutrani (80 miles north of Maan). On the 5th a ton of bombs was dropped on the railway at Kalaat el Hesa (45 miles north of Maan) and the enemy encampments about Shunet Nimrin (on left bank of the Jordan, 10 miles east of Jericho).

MARCH 10th.—The G.O.C. Palestine reports:—

Successful bombing operations were undertaken by the R.F.C. near Lubban (Lebonah, 10 miles south of Shechem), on the main Jerusalem-Nablus road, direct hits being observed on troops and transport.

MARCH 11th.—The G.O.C. Palestine reports:—

Throughout March 10th our aeroplanes co-operated by engaging enemy troops and transport with machine-gun fire and bombs at various points on the Nablus road.

MARCH 11th.—The G.O.C. Mesopotamia reports:—

During their retreat (from Hit) the Turks were attacked by our aeroplanes with bombs and machine-gun fire at heights varying from 2,500 ft. to under 100 ft., and heavy casualties were inflicted on them.

#### HOME COMMAND COMMUNIQUÉS.

MARCH 7th, 12.15 p.m.—Hostile aeroplanes crossed the East Coast shortly after 11 p.m. and proceeded towards London.

The raid is still in progress.

MARCH 8th, 11 a.m.—Last night's air raid appears to have been carried out by seven or eight enemy aeroplanes, of which two reached and bombed London. The first two raiders approached the Isle of Thanet about 10.55 p.m., and proceeded up the Thames Estuary. Both were turned back before reaching London.

Meanwhile, a third raider came across the Essex coast at 11.20 p.m. and steered west. At 11.45 it was reported over East London, and a few minutes later dropped bombs in the South-Western and North-Western districts. At 11.50 p.m. a fourth aeroplane, which had also come in across Essex, dropped bombs to the north of London, and then proceeded south across the capital, dropping its remaining bombs in the northern district between 12.20 and 12.30 a.m.

The remaining enemy machines, all of which came in across the Essex coast, were turned before they reached London.

A certain amount of damage was caused to residential property in London, several houses having been demolished.

12.30 p.m.—Latest police reports state that 11 persons were killed and 46 injured in last night's aeroplane raid.

It is feared that in addition to the above six bodies are still buried in the wreckage of houses. All these casualties occurred in London.

#### PRESS BUREAU COMMUNIQUÉ.

The following official communication was issued by the Press Bureau on March 8th:—

The Commander-in-Chief has requested Army Commander to convey to Commander and all ranks of the First Brigade, Royal Flying Corps, his best congratulations on their splendid success in bringing down 18 enemy aeroplanes in one day, and to state that he is very glad to hear that all our aeroplanes returned safely.

#### THE CASUALTY LIST.

Reported March 6th.

KILLED.—Proudfoot, Sec. Lt. T. J. A., R.F.C.

Roberts, Sec. Lt. L. P., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Gibbes, Sec. Lt. F. W., R.F.C.

Grosvenor, Lt. T., Linc. R., attd. R.F.C.

DIED.—Smith, Sec. Lt. W. C., R.F.C.

WOUNDED.—Sheppard, Sec. Lt. H. E., R.F.C.

MISSING.—Logan, Sec. Lt. G. C., R.F.C.

Williams, Sec. Lt. S. G., Devon R., attd. R.F.C.

Windle, Sec. Lt. B. C. W., R.F.C.

PREVIOUSLY REPORTED PRISONERS, NOW REPORTED WOUNDED AND PRISONERS IN GERMAN HANDS.—Cobbald, Lt. F. R. C., R.F.C.

Frith, Sec. Lt. R. G., R.F.C.

Hart-Davies, Sec. Lt. H. R., R.F.A., attd. R.F.C.

Leach, Lt. J. M., Yorks R., attd. R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER IN GERMAN HANDS.—Williams, Sec. Lt. L. J., R.F.C.

CANADIAN FORCES.—KILLED.—Campbell, Lt. D. G., Cent. Ont. R., attd. R.F.C.

ACCIDENTALLY KILLED.—Laws, Lt. H. A., Sask. R., attd. R.F.C.

WOUNDED.—Blitch, Lt. W. J., W. Ont. R., attd. R.F.C.

Reported March 7th.

DIED OF WOUNDS.—White, Sec. Lt. R. D., R.F.C.

WOUNDED.—Barnes, Lt. W. A., R.F.C.

Hill, Sec. Lt. W., R. W. Kent R., attd. R.F.C.

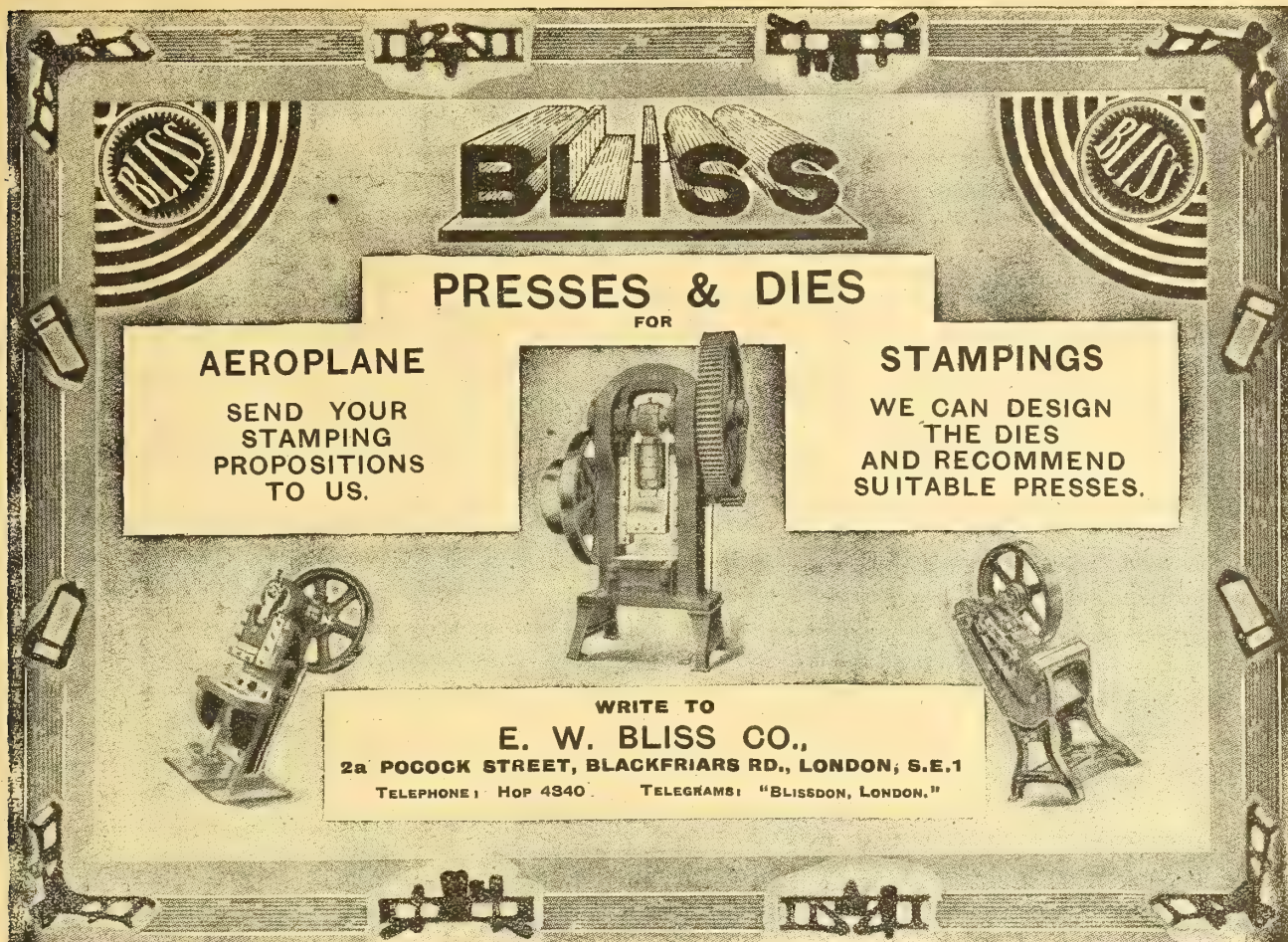
Keeler, Sec. Lt. W. A., R.F.C.

Sutton, Capt. C., R.F.C.

MISSING.—Dempster, Sec. Lt. I. MacK., R.F.C.

Marsh, Sec. Lt. G. R. T., R.F.C.





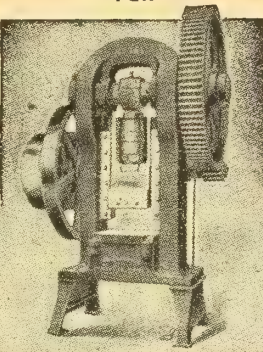
**BLISS**

**PRESSES & DIES**

FOR

**AEROPLANE**

SEND YOUR  
STAMPING  
PROPOSITIONS  
TO US.



**STAMPINGS**

WE CAN DESIGN  
THE DIES  
AND RECOMMEND  
SUITABLE PRESSES.

WRITE TO  
**E. W. BLISS CO.,**  
2a POCOCK STREET, BLACKFRIARS RD., LONDON, S.E.1  
TELEPHONE: HOP 4340. TELEGRAMS: "BLISSDON, LONDON."

# W. CANNING & CO. *Lustre Works,* *Gt. Hampton Street*

## BIRMINGHAM

AND 18/20, ST. JOHN'S SQUARE,  
CLERKENWELL, LONDON, E.C.1.

### MANUFACTURERS OF

Motor Generators, Low Voltage Dynamos, Vats,  
Chemicals, Complete Plant for  
**ELECTRO - ZINCING (COLD GALVANIZING)**

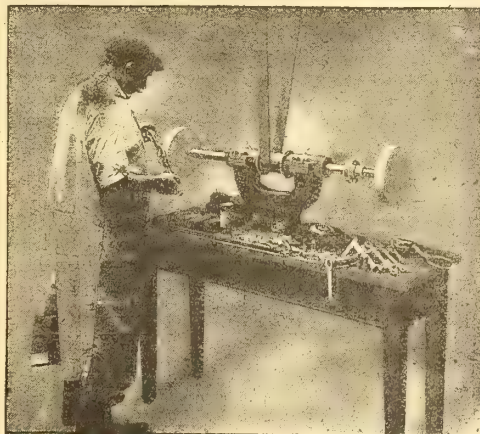


For Aeroplane Stay Wires, Connections.

**Also NICKEL, COPPER AND BRASS  
PLATING AND TINNING, &c., OUTFITS.**

Contractors to the British, Colonial, and Foreign  
Governments, Railways and Shipyards.

**POLISHING MACHINERY & MATERIALS  
FOR AERO ENGINE & OTHER PARTS.**



**POLISHING LATHES,** with Self-Oiling and  
Ball Bearings. EMERY GRINDERS, POLISHING  
MOPS, POLISHING BOBS, POLISHING COM-  
POSITIONS, "LUSTRE" POLISH.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



AUSTRALIAN FORCE.—WOUNDED.—Brook, Sec. Lt. A. O'C., Flying Corps.

MISSING.—Coustin, Sec. Lt. A., Flying Corps.

Reported March 8th.

KILLED.—Gresley-Cox, Sec. Lt. E. L., R.F.C.

ACCIDENTALLY KILLED.—Galbraith, Sec. Lt. A. H., R.F.C.

WOUNDED.—Birch, Sec. Lt. E., E. Lanc. R., attd. R.F.C.

Collins, Sec. Lt. A. O., R.F.C.

Pattern, Capt. J. A., R.F.C.

Price, Sec. Lt. J. C. E., Lond. R., attd. R.F.C.

Scanlan, Lt. W. H., R.F.C.

Stuart, Sec. Lt. C., R.F.C.

PREVIOUSLY REPORTED WOUNDED, NOW REPORTED NOT WOUNDED.

Howitt, Lt. F. D., A.S.C., attd. R.F.C.

INDIAN FORCES.—PREVIOUSLY REPORTED MISSING, NOW REPORTED

KILLED.—Taylor, Lt. A. G. V., I.A., attd. R.F.C.

ACCIDENTALLY KILLED.—Robertson, Sec. Lt. F. H., I.A.R.O., attd. R.F.C.

Reported March 9th.

KILLED.—Cartwright, Sec. Lt. R. W. St. G., R.F.C.

Guest, Sec. Lt. E. W., R. Lanc. R., attd. R.F.C.

Kennard, Sec. Lt. T. E., R.F.A., attd. R.F.C.

Sherwood, Sec. Lt. R., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Barnes, Capt. E. E., R.E., attd. R.F.C.

Mills, Capt. R. N. F., A.S.C., attd. R.F.C.

Scott, Lt. D. H., M.C., R.F.C.

Sloley, Lt. R. H., R.G.A., attd. R.F.C.

ACCIDENTALLY KILLED.—Doughty, Sec. Lt. R. C., R.F.C.

DIED.—Robinson, Sec. Lt. H. A., R.F.C.

WOUNDED.—Ashton, Lt. H. G., Lond. R., attd. R.F.C.

Duthie, Lt. W. G., R.F.C.

Quested, Maj. J. B., M.C., R.F.C.

MISSING.—Ackers, Sec. Lt. C. H. S., K. R. Rif. C., attd. R.F.C.

Allen, Sec. Lt. J. M., R.F.C.

Crosbee, Sec. Lt. C. H., R.F.C.

Dougall, Sec. Lt. H. F., R.F.C.

Doyle, Sec. Lt. D. C., R.F.C.

McIntock, Lt. J. L., R.F.C.

Wade, Sec. Lt. R. C., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN GERMAN HANDS.—Lefevre, Lt. F. E., M.C., Linc. R., attd. R.F.C.

Martin, Sec. Lt. P. C. C., Sher. For., attd. R.F.C.

Taylor, Sec. Lt. L. G., R.F.C.

Urwin, Sec. Lt. T. A., R.F.C.

CANADIAN FORCES.—MISSING.—Law, Lt. J. R., Can. A.S.C., attd. R.F.C.

Shaw, Lt. G. M., Cent. Ont. R., attd. R.F.C.

Wright, Lt. D. C., W. Ont. R., attd. R.F.C.

Reported March 11th.

KILLED.—Scudamore, Capt. R. C., M.C., R.F.C.

DIED OF WOUNDS.—Green, Sec. Lt. A. H., R. E., attd. R.F.C.

WOUNDED.—Moir, Sec. Lt. J. A., R.H.A., attd. R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED WOUNDED AND PRISONER IN GERMAN HANDS.—Powell, Maj. F. J., M.C., R.F.C.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN GERMAN HANDS.—Crawford, Sec. Lt. O. G. S., R.F.C.

Sibley, Capt. S. J., R.F.C.

Reported March 12th.

KILLED.—Purser, Sec. Lt. N. F., R.F.C.

Webster, Sec. Lt. G. A. M., S. Lanc. R., attd. R.F.C.

Wilkes, Sec. Lt. H. J. T., R.F.C.

Winter, Sec. Lt. J., R.F.C.

Witt, Sec. Lt. C., K.R.R.C., attd. R.F.C.

MISSING.—Dickens, Lt. M. W., R.F.C.

Krohn, Sec. Lt. E. O., R.F.C.

AUSTRALIAN FORCE.—MISSING.—Randell, Lt. W. B., Fl. Corps.

\* \* \*

CASUALTIES AMONG WT. OFFICERS, N.C.Os. AND MEN.

THE DATES ARE THOSE OF THE OFFICIAL LIST:—

KILLED.

FEB. 25th.—R.F.C.—Kingsland 113340 2nd Cl. Air Mech. F. G. (Farnborough).

MARCH 1st.—Harvey 106098 2nd Cl. Air Mech. C. N. (West Hartlepool); Mills 5288 Flt.-Serjt. H. (Gorton); Pickard 23959 Serjt. G. (Moldgreen).

PREVIOUSLY MISSING, NOW REPORTED KILLED.

FEB. 27th.—R.F.C.—Heedy 11730 Q.-A.-M. J. (Failsforth); Lambeth 88285 Serjt. G. E. (Snodland); Roebuck 5788 Serjt. W. H. (Horwich).

DIED.

FEB. 25th.—R.F.C.—Rafter 101944 3rd Cl. Air Mech. T. (Corralla, Co. Sligo).

MARCH 1st.—Clark 45687 2nd Cl. Air Mech. J. (Stratford, E.).

MARCH 2nd.—Rayner 16452 1st Cl. Air Mech. W. J. (Walthamstow, E.).

WOUNDED.

MARCH 2nd.—R.F.C.—Cox 48769 1st Cl. Air Mech. T. W. S. (Abingdon); Seery 51216 3rd Cl. Air Mech. J. (Dublin).

MISSING.

FEB. 26th.—R.F.C.—Belchamber 41223 1st Cl. Air Mech. W. (Falmouth).

PREVIOUSLY REPORTED WOUNDED, NOW REPORTED NOT WOUNDED.

MARCH 1st.—R.F.C.—Elders 26282 1st Cl. Air Mech. P. T. (Chiswick, W.).

PREVIOUSLY MISSING, NOW REPORTED DIED AS PRISONER OF WAR IN GERMAN HANDS.

FEB. 27th.—R.F.C.—Smith 78930 2nd Cl. Air Mech. F. J. (Hornsey, N.).

PRISONER OF WAR.

MARCH 2nd.—R.F.C.—Mole 5077 1st Cl. Air Mech. J. L. (Liscard).

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS OF WAR IN GERMAN HANDS.

FEB. 27th.—R.F.C.—Everix 3217 Serjt. M. H. (Reading); Hogard 49929 2nd Cl. Air Mech. T. H. (Bridlington).

FEB. 28th.—Hewitt 94294 2nd Cl. Air Mech. W. (Portadown).

## PERSONAL NOTICES.

### ENGAGEMENTS.

DE LA BERE—HUMPHERY.—The engagement is announced between Lt. Rupert De la Bère, E. Surrey R., attd. R.F.C., son of Mr. and Mrs. De la Bère, of The Croft, Addlestone, and Marguerite (Peggy), eldest daughter of Lt.-Col. Sir John and Lady Humphery, of Walton Leigh, Addlestone.

GOULD—SPERLING.—The marriage arranged between Maj. L. N. Gould, M.C., R.G.A. and R.F.C., and Miss Barbara Sperling will take place at Holy Trinity Church, Leamington, on Wednesday, April 3rd, at a quarter to two o'clock. No invitations will be sent, but all friends will be welcome at the church.

RANDOLPH—WALDEGRAVE.—The marriage arranged between Lt. George Algernon Randolph, Yeo., attd. R.F.C., and Miss Elisabeth Katharine Waldegrave will take place quietly at All Saints' Church, Lullington, Somerset, on Saturday, March 16th, at 2.30 o'clock. All friends will be welcome at the church.

RIORDAN—HOWARD-GRAFTON.—A marriage has been arranged and will shortly take place between Lt. Leo J. Riordan, R.A. and R.F.C., of London and Johannesburg, and Olga, eldest daughter of the late M. Ernest Howard-Grafton and Madame Howard-Grafton, of Paris.

SHIPWRIGHT—HAIN.—An engagement is announced between Sec. Lt. Denis Ewart Bernard Kingston Shipwright, R.F.C., younger son of the late Thomas Johnson Shipwright, and Mrs. Shipwright (Mme. Adelina de Lara), and Kate, daughter of the late Sir Edward Hain, and Lady Hain, of Treloyhan, St. Ives, Cornwall.

WADDINGTON—FARMER.—A marriage has been arranged, and will very shortly take place, between Capt. R. M. Waddington, W. Yorks R., attd. R.F.C., and Mrs. George Farmer, widow of Lt. G. A. Farmer, K.R.R.C.

### MARRIAGES.

ALLEN—THOMAS.—On the 7th inst., at Marylebone Parish Church, London, Capt. Gerald Allen, the Connaught Rangers (Major R.F.C.), son of Mr. Robert Allen, Coolgrena, Rushbrook, Co. Cork, was married to Mina Margaret, only daughter of Brig.-General Sir Owen and Lady Thomas, of Cemaes, Anglesey.

COATES—RANK.—The marriage took place on March 5th, at St. Andrew's Church, Kingswood, of Capt. L. C. Coates, the R.F.C., second son of Mr. and Mrs. David Coates, of West Dulwich, and Miss Kathleen V. Rank, youngest daughter of Mr. Joseph Rank and the late Mrs. Rank, of Kingswood Warren, Surrey.

DEWAR-MURRAY—WARREN-VERNON.—On March 7th, at Richmond, D. J. Dewar-Murray, attd. R.F.C., was married to Mrs. R. Warren-Vernon, of Toddington Manor, Beds.

DINGLEY—WHEELER.—On March 9th, Capt. and Adj. Walter L. Dingley, Cheshire Regt. and R.F.C., son of Mr. and Mrs. Alfred Dingley, of Welford, near Stratford-on-Avon, was married to Norah Catherine Brash, daughter of the late G. Brash Wheeler, of Queen Victoria Street, and Beckenham, Kent, and Mrs. G. Brash Wheeler, of 52, Twyford Avenue, Acton.

HENDERSON—CRAIG.—On 4th inst., at Winterborne Stoke, Wilts., Capt. Malcolm Henderson, D.S.O., Seaforth Highlanders and R.F.C., was married to Elizabeth Craig, daughter of Frederick Craig, of St. Columb, North Cornwall.

HIGSON—STORR.—On March 6th, at Holy Trinity Church, Darlington, Lt. Aubrey Wilson Higson, A.S.C., attd. R.F.C., youngest son of Jacob Higson, M.I.C.E., Northwood, Middlesex, was married to Vera Marguerite, youngest daughter of Walter W. Storr, J.P., F.R.G.S., Uplands, Darlington, by the Rev. F. Peacock, M.A., Vicar, assisted by the Rev. J. R. Missen.

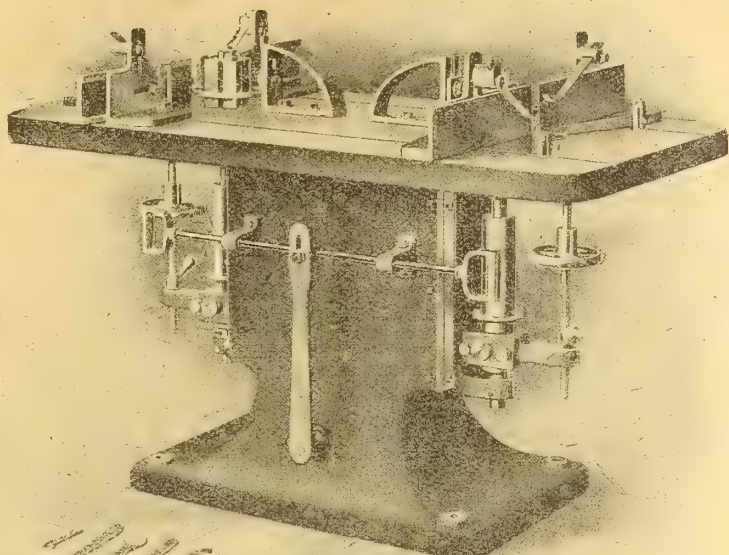
JOHNSON—PIKE.—On March 2nd, at St. Saviour's, Knightsbridge, Sec. Lt. Godwin Harry Johnson, R.F.C., son of the late Mr. and Mrs. Godwin S. Johnson, was married to Lilian May,



# HAIGHS

(OLDHAM) LIMITED

MANUFACTURERS OF ALL KINDS OF WOODWORKING MACHINERY.



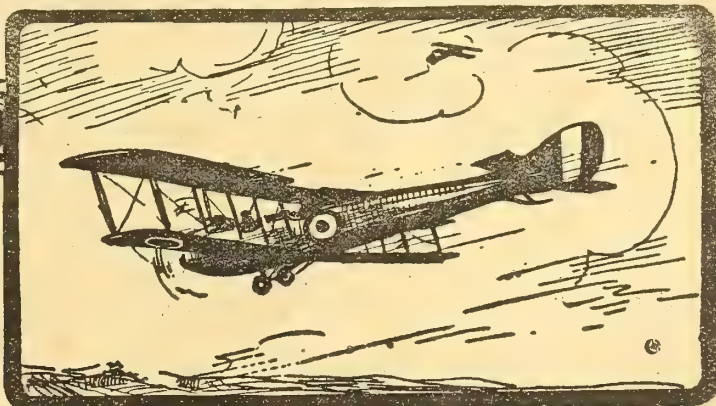
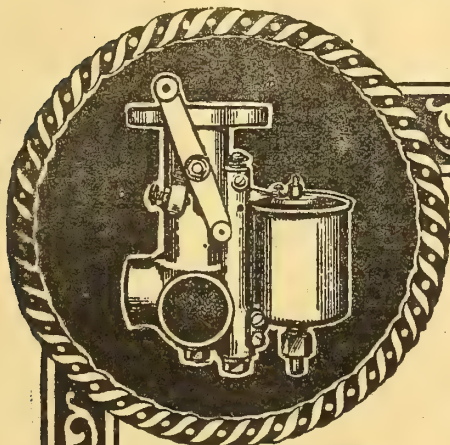
## D.D. Double-Spindle Circular Moulding Machine

Suitable for many varieties of irregular and circular work required in a Cabinet Maker's, Joiner's, or Builder's Works.

Globe Iron Works,  
OLDHAM.

Telegrams: HAIGH. OLDHAM.  
Telephone: 1273 Oldham.

*Haighs*  
(OLDHAM) LTD.



## ZENITH CARBURETTER

Send for

Illustrated Booklet. ZENITH CARBURETTER CO., LTD. 40-42 Newman St. LONDON, W.1.

Where swiftness,  
efficiency, and reliability  
are needed in the Government  
Service—there you  
will find the  
Zenith Carburettor



third daughter of the late W. Vincent Pike and Mrs. Pike, 32, Basil Street, Knightsbridge.

**NORTHAM—TOSEN.**—On March 3rd, at St. Paul's, Herne Hill, Lt. Herbert Victor Northam, R.F.C., younger son of Mr. and Mrs. Northam, of Croxsted Road, Dulwich, was married to Herminie, daughter of the late J. J. Tosen and Mrs. Tosen, of 67, Beckwith Road, Herne Hill, by the Rev. L. P. Smith.

**STEWART—SULLEY.**—The marriage of Lt. William George Stewart, R.F.C., and Miss Sylvia Gordon Sulley took place very quietly at the Church of St. Mary Abbot, Kensington, on March 9th. The Rev. W. Stewart, uncle of the bridegroom, officiated. The bride was given away by Col. Brown-Syngé-Hutchinson, V.C., C.B. Fit.-Lt. C. R. H. Stewart, R.N.A.S., was best man.

#### BIRTH.

**NUTTALL.**—On March 5th, at 84, Philbeach Gardens, the wife of Capt. W. E. Nuttall, R.F.C., of Gillsbrook, Rivington, Lancs., of a daughter.

Mr. W. T. Massey, writing from Palestine on March 6th, says:—

Our aerial supremacy has been maintained, and though the German aviators show signs of more activity, they pay dearly for it. This week three machines were brought down in air fights by the R.F.C. and the Australian Flying Corps, who have done much bombing work this year. In the last two days they have made long flights to the Dead Sea to harass the enemy's communications with the Hedjaz. Once they dropped many bombs on Katrani station and the camps and aerodrome west of Kerak. Excellent results were observed. Yesterday they bombed the station south of Karani.

#### FRANCE.

##### OFFICIAL COMMUNIQUÉS.

**MARCH 6th.**—During the 5th, three Germans were brought down by our pilots and two by the fire of our anti-aircraft guns.

**MARCH 7th.**—German aviators bombarded during the night of Wednesday the region to the north of Nancy. There were no victims.

Yesterday four German aeroplanes were brought down by our pilots.

Our bombing machines dropped 12,000 kilos (about 12 tons) of explosives on railway stations and ammunition dumps in the enemy zone.

**MARCH 8th, 10.50 p.m.**—A raid by enemy aeroplanes is pro-

ceeding. Our aeroplanes immediately ascended. At 10.30 p.m. bombs were reported to have fallen at various points, and casualties and material damage are announced. Details are still lacking. More complete details will be given as soon as authoritative information comes to hand.

**MARCH 9th, 1.50 a.m.**—The warning was given at 8.50, and the "all clear" signal went at 12.15 a.m. According to the first information, several squadrons of aeroplanes managed to cross our lines, and in succession reached the Paris district. It now appears that a certain number of machines were harassed by our anti-aircraft fire and our aviators and were unable to accomplish their mission. As soon as the warning had been given barrage fire was opened, and a large number of French aeroplanes went up. The number of victims is not yet known, but it appears to be smaller than in the last raid. The patrol and ambulance services worked well, and the new measures of protection adopted proved effective.

The number of victims is as follows:—

IN PARIS.	
Killed .....	7 (3 men and 4 women)
Injured .....	26 (16 men, 7 women, 3 children)
IN THE SUBURBS.	
Killed .....	4 (3 men and 1 child)
Injured .....	15 (7 men, 7 women, and 1 child)
IN SEINE-ET-OISE DEPARTMENT.	
Killed .....	2
Injured .....	9

**MARCH 10th.**—A German aeroplane was brought down by our anti-aircraft guns on March 7th. During March 8th two German aeroplanes were brought down by our pilots.

In the course of Saturday two German aeroplanes were brought down by our pilots and 10 others seriously damaged fell in their own lines. It is confirmed that five German aeroplanes were brought down on Wednesday and Friday.

Our bombarding aeroplanes made several flights; 14,000 kilogrammes (14 tons) of projectiles were dropped on railway stations, cantonments, and aviation grounds in the enemy zone. Several fires were observed.

**MARCH 11th.**—Yesterday five German aeroplanes were brought down or gravely damaged in the course of aerial fights. Our bombing squadrons dropped 10,000 kilogrammes (nearly ten tons) of projectiles on various enemy stations and establishments in the region of the north and east.

Enemy aeroplanes raided Paris to-night. The alarm was given at 9.10 p.m. Seven squadrons were reported to be on their way to Paris, and at 10.15 bombs were reported to have been dropped at several points. There have been casualties, and damage has been done to property. Details will be published as soon as precise reports come to hand.

\* \* \*

A semi-official statement issued in Paris on March 9th says:—  
"The German communiqué announces that the air raid on Paris was in reprisal for the enemy attacks on the open towns of Trèves, Mannheim, and Pirmasens on February 19th and 20th. The German assertion is a lie. No French aeroplane has bombed Trèves, Mannheim, or Pirmasens."

\* \* \*

Reuter's Special Service stated on March 9th that one of the German aeroplanes, which started from Paris along the Oise valley on March 8th, was shot down by a well-placed shell over the Forest of Compiègne on the outward journey. It was a powerful machine of the Friedrichshafen type, driven by two motors, and carrying a complement of four men—namely, the commander, pilot, machine-gunner, and mechanic. It must have been hit some minutes before it crashed, as it shed its cargo of bombs at random among the trees, evidently in order to be rid of them. Of six bombs it carried only one was left when the

## SIXTH EDITION, 918. DYKE'S AUTO-ENCYCLOPEDIA.

### THE STANDARD WORK ON MOTOR MECHANISM

Sanction has been given for this Book to be supplied through H.M. Stationery Office to Schools of Military Aeronautics.  
Adopted by the American Government (War Dept.) for use in all their Aviation Schools.

**A Thorough, Practical & Simple Treatise on Principle, Construction, Repairs and Troubles—and How to Remedy Them.**  
**THE BOOK for the EXPERT and the STUDENT.**

Containing upwards of 900 pages. 775 Illustrations on Electrical Subjects  
1,189 Illustrations on Repairs and Adjustments. 300 Illustrations on "The Ford."  
5 Coloured Inserts.

OVER 250,000 COPIES SOLD.

Price £1:1:0 net, post free, cash with order,  
from your Bookseller, or direct from the Publisher,

S. G. GILLAM, Dom2 Building, RICHMOND, SURREY.  
\* \* \* Prospectus on Application.

## Metal Fittings for A. V. ROE PLANES

## BRACING PLATES

Drawing SS 190. Items 2, 3, 4, and 5.  
,, SS 264. ,, 2, 3, 4, and 5.

**A. LLOYD & SONS, LTD.,**  
PIER WHARF,  
DEPTFORD, S.E. 8, LONDON.

## FREMO TAPER



## PINS

Does the taper pin enter into your products? If so your reputation may easily rest upon a taper pin. We supply only taper pins which build and maintain reputations.

**Fredk. Mountford Ltd.**

**Fremo Works, Lifford, BIRMINGHAM**





**Alldays**

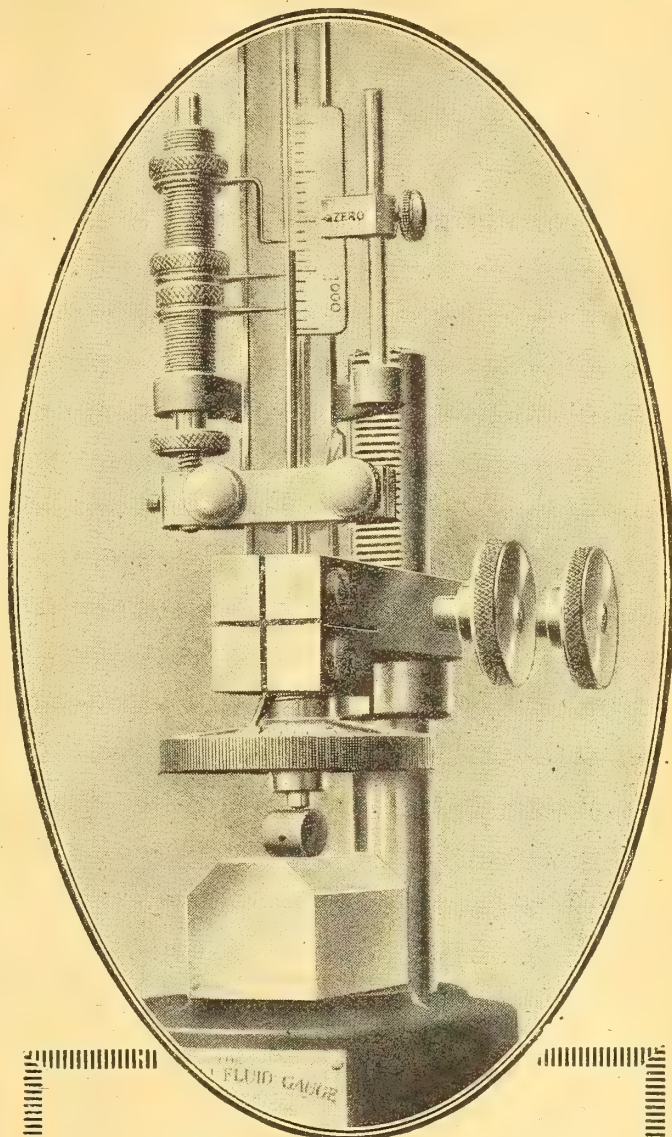
**"EMPIRE"**  
**GAS FIRED BRAZING TABLE**

For use in the construction of Aeroplanes.

This Table is so arranged that a centre flame is obtained which is specially useful for local heating, Brazing, etc.

For all particulars write to

Sole Makers  
**Alldays & Onions Co. Ltd.**  
**BIRMINGHAM**  
And at  
**58, Holborn Viaduct,**  
**LONDON, E.C.1.**



## WITHIN THE LIMITS!

The exact amount of any error is quickly and definitely registered by

*The* **Prestwich** FLUID *Gauge*  
Accuracy to the ten-thousandth part of an inch with ease

An error of  $\frac{1}{1,000}$  of an inch is indicated by  $1\frac{1}{2}$  inch travel on the column.

There are no wearing parts.

Sense of touch is eliminated and skilled viewers are not essential.

Readings may be taken to  $\frac{1}{50,000}$  part of an inch at the rate of 60 per minute if necessary.

Every factory engaged on repetition work which needs viewing to fine limits should use the Prestwich Gauge—the instrument will save its cost in a few weeks. Why not write us to-day for full particulars? Our illustrated catalogue is free on request.

**J. A. PRESTWICH & CO.,**  
Northumberland Park,  
TOTTENHAM, LONDON, N.17.

**Sample Tin**  
**Gratis to**  
**Aero**  
**Engine**  
**Builders.**



L'Hermetic filled joint is as impervious to any outside agency as is the surface of the metal itself.

L'Hermetic, which is a heavy liquid compound, dries immediately on application and impregnates the joint—making it air-tight, water-tight, grease-tight, dirt and dust proof. L'Hermetic is also heatproof and insoluble in all spirit, oil and fatty essences.

Extensively used by the French military authorities and by all the leading French aero engine manufacturers.

**MESTRE & BLATGE,**  
20, Store Street, London, W.C.1.

Telephone: Museum 1220-1. Telegrams: "Mesblon, Westcent, London."

J. W. HAWKES, Manager.

**COMPOSITION**  
**FOR AERO ENGINE JOINTS**



machine smashed upon the ground, and this buried itself in the earth without exploding.

The machine was utterly wrecked, and the four occupants were killed instantly. Two of them, the commander and the mechanic, either jumped or were thrown from the aeroplane, as they fell some distance clear of it. Papers found on the former show that he was a squadron commander and a captain, by name Fritz Echstein. The pilot was a lieutenant in the Cuirassiers of the Guard.

The aeroplane was built last October. The wings, soft, from tip to tip, were camouflaged in black, grey, and violet, to render them invisible.

\* \* \*

"L'Eclair" learns from Holland that one of the best French bombing pilots, Lt. Mezergues, has escaped from Germany.

\* \* \*

A message from Paris dated March 10th states that M. Clemenceau, accompanied by M. Dumesnil, Under Secretary of State for Aviation, has been at the front, where he visited several of the flying squadrons, in particular those which bombarded German aerodromes at the time of the raid on Paris. The Prime Minister congratulated the pilots and decorated several of them.

\* \* \*

A message from Paris on March 7th stated that Lieut. Garros, the French aviator who recently escaped from Germany and returned to France, has been made Officier de la Légion d'Honneur, and his confrère, Lieut. Marchal, Chevalier de la Légion d'Honneur.

The official citation describes Lieut. Garros as a great aviator before the war, whose name is a symbol of bravery and modesty. Lieut. Marchal is thus cited:—

A first-class pilot who, after giving brilliant proof of his bravery at the front, volunteered for a very daring enterprise. He fell into the enemy's hands, after flying more than 800 miles over German territory, and succeeded in effecting his escape under circumstances which give further proof of his high military and personal qualities.

\* \* \*

During the air raid on March 11th the Germans lost four aeroplanes, three of which were four-seated Gothas and one was a biplane. It is confirmed that the enemy forces engaged were particularly important. Nine squadrons took part in the raid. They followed two routes, some by between the Oise and the Ourcq, and others following the Creil-Paris-Soissons-Paris railway line.

The French bombing aeroplanes carried out an extremely



**AIRCRAFT DEPARTMENT**

THE WORLD'S LARGEST MANUFACTURERS OF ALL KINDS OF ENGRAVED METAL GOODS

**British Metal (Kingston) Ltd.**

*The Factory,*

**Kingston-on-Thames**

---

**DIALS & INSTRUCTION PLATES**

MADE IN ANY METALS,  
IVORY, IVOROID, BONE, ETC.  
ANY QUANTITIES, WORDING, DESIGN,  
SIZE, SHAPE OR COLOURS.

---

COMPLETE SHEET METAL  
**AIRCRAFT COMPONENTS**  
RIVETED, SWEATED, BRAZED OR WELDED.  
R.E., F.E., B.&D, B.E., C-D-E,  
SE, DE H.  
RESIDENT A.I.D. EXAMINER.

## HIGH-CLASS ALUMINIUM CASTINGS

FOR ALL TRADES.

We Specialise in Aluminium Cylinders and  
General Aero and Motor Engine Castings,

## CAST IRON CYLINDERS

Water and Air-cooled for Aero & Motor Engines

ALL THE ABOVE CASTINGS  
TO GOVERNMENT SPECIFICATION.

**WILLIAM MILLS, LTD.,**

Atlas Works :: Grove Street,

**BIRMINGHAM.**

ALUMINIUM AND IRON FOUNDERS.

## Aircraft Fittings.

## GABRIEL & CO.

*Manufacturers of*  
**AEROPLANE FITTINGS in BRASS,  
COPPER, GUN METAL, BRONZE  
AND GLASS ALUMINIUM.**

Castings supplied either Machined complete  
or in the rough.

Sheet Metal Work in Brass, Copper, Steel,  
Tin, or Aluminium, including Spinings,  
Stampings and Pressings.

**A.G.S. FLANGES, PETROL FILTERS, ETC.**

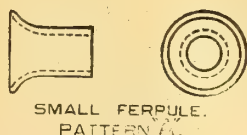
Tube Bending and Capstan Work a speciality.

*Contractors to Admiralty, War Office,  
Ministry of Munitions, H.M. Air Board,  
Royal Aircraft Factory and Crown  
Agents for the Colonies.*

TEL. ADDRESS:  
GABRIEL, BIRMINGHAM  
TELEPHONE:  
CENTRAL 1223.

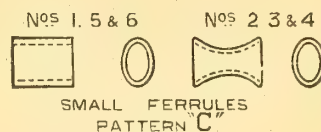
**4 & 5, A. B. ROW,  
BIRMINGHAM**





SMALL FERRULE.  
PATTERN "A".

**WE CAN SUPPLY  
THESE AT ONCE**



SMALL FERRULES  
PATTERN "C"

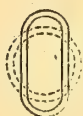
IN VARIOUS GAUGES AND LENGTHS  
- SEND FOR FULL PARTICULARS -

# FERRULES FOR AIRCRAFT WORK

THE AEROPLANE STEEL TUBE AND PRESSWORK ARTIFICERS



SMALL FERRULE.  
PATTERN "B".



OLDBURY

BIRMINGHAM

Telegrams: "ACCLES," OLDBURY Telephone: OLDBURY 111 (4 lines)  
A.B.C. CODE, 5th Ed.



SMALL FERRULE  
PATTERN "D"

Telephones: DALSTON 872.

LONDON WALL 9766.

HAMPSTEAD 4768.

## Thames Aviation Works

(BURTON'S, LTD.)

**TWO COMPLETE MILL PLANTS AND TWO YEARS' EXPERIENCE.**

Addresses of our fine Saw Mills, Works, etc.,  
— have been camouflaged by the Censor. —

Offices only: 141, CURTAIN ROAD, E.C.

**CONSTRUCTORS OF COMPLETE AIRCRAFT**

And all kinds of WOOD PARTS, WINGS, AILERONS,  
— STRUTS, LEVERS, RUDDERS, NACELLES, &c. —

**Specialities—BIG STUFF and BEST WORK.**



vigorous counter offensive on the aerodromes from which the enemy machines started.

A total of 5,800 kilogrammes of explosives were dropped and numerous bombs reached their mark. The number of casualties caused by the enemy raiders will be communicated later.—(Reuter.)

#### GERMANY.

##### OFFICIAL COMMUNIQUÉS.

MARCH 7th.—Nineteen enemy aeroplanes and two captive balloons were brought down yesterday in aerial fighting. Capt. Ritter von Tutschek obtained his 26th victory in the air.

A great many French inhabitants have been killed by bombs dropped by English aviators on the hospital in Tourcoing (north-east of Lille).

MARCH 8th.—During the night from March 7th-8th London, Margate, and Sheerness were attacked with bombs by several aeroplanes. Good effects were observed.

MARCH 10th.—During the last two days 28 enemy aeroplanes and one captive balloon were shot down.

The Bülke chasing squadron brought down its 200th opponent.

As a reprisal for the dropping of bombs by the enemy on the open towns of Trèves, Mannheim, and Pirmasens on Feb. 19th and 20th our aeroplanes again attacked Paris with bombs during the night March 8th-9th with great effect.

MARCH 11th.—Capt. Ritter von Tutschek and Lieut. Wüsthoff achieved their 27th and First Lieut. Bethge his 20th aerial victories.

\* \* \*

Reuter reported from Amsterdam on March 11th that Ober-Lieut. Buddecke has been killed in aerial combat. The deceased aviator was famous as the star turn of the Levant war area, and was reported to be a good sportsman.

#### ITALY.

##### OFFICIAL COMMUNIQUÉS.

MARCH 6th.—In the course of the day our aircraft bombarded the enemy aviation ground of Motta di Livenza and a column of troops caught marching in the neighbourhood of Oderzo (both east of the Lower Piave).

Over Conegliano (nine miles east of Montello) a British aviator shot down a hostile machine.

MARCH 8th.—British batteries and aviators brought down a hostile aircraft and set fire to two captive balloons.

Navy seaplanes dropped two tons of bombs over the enemy huts and encampments below Grisolera (Lower Piave).

## BURBERRY R.F.C. KIT

**BURBERRYS** supply correct and well-tailored Uniforms, Weatherproofs, Air-Warms, Fur Undercoats, Leather Coats, British-Warms, Caps, and every detail of R.F.C. dress and equipment, at reasonable prices.

**BURBERRY KIT**, made in special Burberry-woven and proofed cloths, in textures suitable for France, or the Near or Far East, provides an effective safeguard against wet or wind, and, whilst lightweight, is the strongest and most comfortable equipment for facing the atmospheric conditions of varying altitudes.

#### Service Weatherproofs.

During the War **BURBERRYS** Clean and Re-proof Officers' "Burberrys," Ti-lockens, Burfrons, and Burberry Air-Warms **FREE OF CHARGE.**



Illustrated  
Military  
Catalogue  
Post Free.

Every  
Burberry  
Garment  
bears a  
Burberry  
Label.

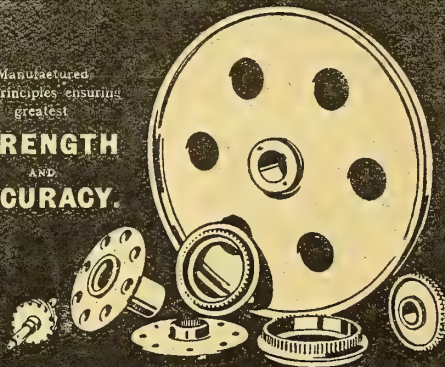
**Complete Outfits in  
2 to 4 Days, or  
Ready-to-Wear.**

**BURBERRYS, Haymarket, S.W. LONDON**  
8 & 10 Bd. Malesherbes, PARIS; and Provincial Agents

## MOSS— AERO-ENGINE GEARING

Manufactured  
on principles ensuring  
greatest

**STRENGTH  
AND  
ACCURACY.**



**GEARING—FLYWHEELS—CAMSHAFTS**

**R.A.F. PROPELLER BOSSES.**

Our Aero parts are made in specially **HIGH TENSILE STEEL**, heat treated and all parts corrected for distortion.

**TRANSPORT, LORRY & PLEASURE CAR GEARING**

Bevel and Worm Drives accurately generated; Steering Worms and Sectors; Spur and Bevel Differentials; Gear Box Gears; Camshafts with guaranteed Glass-hard Cam Profiles.

## —GEARING

**THE MOSS GEAR CO., LTD.,**

W. DUCKETT, Managing Director, Thomas St., Aston, BIRMINGHAM

WHEN CORRESPONDING WITH ADVERTISERS.

# Bowden Wire Ltd.

**LONDON**  
VICTORIA ROAD  
WILLESDEN JUNCTION, N.W.10


Victoria Road, Willesden Junction, N.W.10.

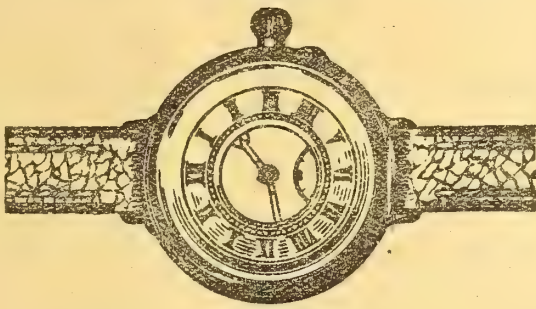
THE varied uses and adaptations of Bowden Wire mechanism are recognised by almost every department of State Service. The war work which we have in hand for Home and Allied Governments precludes for the present our acceptance of private orders.

Established 1897.

KINDLY MENTION "THE AEROPLANE"



JEWELLERS  SILVERSMITHS  
BY APPOINTMENT



Patent No. 11876/15.


**THE "MILITARY"  
LUMINOUS WATCH.**

**A** THOROUGHLY reliable and practical luminous watch, indispensable for Naval or Military Service. The "Military" Luminous Watch is the only Screw Case Silver Watch fitted with a "hunter" cover, and is the exclusive patent of The Goldsmiths and Silversmiths Company, Ltd.

As illustrated. Without Cover.  
**£4 12 6      £3 15 0**

**THE  
GOLDSMITHS & SILVERSMITHS  
COMPANY LTD.** with which is incorporated The Goldsmiths' Alliance Ltd. Established 1724

*Only one Address (no branches):*  
**112, REGENT STREET, LONDON, W.**

The All  British  
**Standard**  
 **LIGHT CAR**



**ALWAYS  
A  
SURE  
PILOT**

Your name and address now will ensure you receiving details of our post war models when ready

**The Standard Motor Co., Ltd., Coventry.**  
London Agents: The Pychley Autocar Car Co., Ltd., 216, Gt. Portland Street, W.

**TAPES  
WEBS  
CORDS  
AND  
THREADS**  
*for* **AIRCRAFT**  
**ELECTRICAL & MUNITION WORK.**



**JOHN MAC LENNAN & Co**  
30 Newgate St  
LONDON. E.C.1.

**AND AT GLASGOW.**

**AEROPLANE**

We are making various Parts for Aeroplane Construction, including—

Tubes and Tubular Construction. Sheet Metal Pressed Parts. Wheel Rims and Special Sections in Steel of any length, gauge or width. Brazing, Acetylene, and Electric Welding, etc.

We can also make any Special Parts to instructions. Send us your enquiries.

**THE LOMBARD  
RIM & TUBE CO.,**  
Lombard Street,  
BIRMINGHAM.

**PARTS**



MARCH 9th.—Our aircraft, notwithstanding adverse atmospheric conditions, bombarded a big carriage park of the enemy north-east of Oderzo (east of Lower Piave).

MARCH 11th.—Our batteries, efficaciously helped by aircraft observation, caused the burning of an enemy's battery, hit enemy working parties east of Salettuol, and dispersed and sunk rafts and boats opposite Fagare.

During the day our aeroplanes bombarded the enemy's aviation grounds, and other camps were bombed in the night by five airships. In all seven tons of bombs were dropped, and all of our aircraft returned unscathed to their bases notwithstanding the violent fire of the enemy.

On the left side of the Piave British aviators brought down two hostile machines.

A Reuter's message states that Naples was the object of an air raid about one o'clock on March 11th. About twenty bombs in all were dropped on the city, almost all of them being on the residential quarter, thus causing no damage of a military nature.

There were several victims amongst the civil population. A bomb which dropped on the Hospital of the Little Sisters near Arco Mirello claimed seven victims amongst those sheltering there.

The population everywhere remained quiet. The ambulance services worked in a most praiseworthy manner.

The newspapers state that the recent (and only) raid on Innsbrück was carried out by four Ansaldo-built machines, presumably S.V.A.S., with among others on board the Count Palma di Cesnola, of pre-war fame, and Arrigoni, a present-day "meteor" of high brilliance. The distance is 500 kilometres return journey.

Comdr. Pio Perrone, of the firm, has put one million lire at the disposition of the authorities as awards for conspicuous bravery displayed by pilots of Ansaldo machines in the present war.—T. S. H.

#### RUSSIA.

The correspondent of the "Morning Post," writing from Petersburg on March 4th, says:—

For five days past aeroplanes, singly or in couples, have been flying, sometimes extremely low, over Petrograd. They have dropped a few bombs. Whether they are German aeroplanes has not been definitely ascertained.

Only on one occasion have these mysterious aircraft dropped

# Bowden

**BOWDEN  
CONTROLS  
AND  
BOWDEN CABLES  
FOR ALL  
AEROPLANE  
PURPOSES.**

Quotations on application.

Note Address—

**The BOWDEN BRAKE  
Co., Ltd., Tyseley,  
B'HAM.**



# Tyseley

KINDLY MENTION "THE AEROPLANE"

# Alardux

**Alardux is the New Aluminium Flux**

**A Welding Flux of exceptional merit**

**May we send you a sample?**

**The Alardux Co.,  
23, Fleet Street,  
London, E.C.4.**

City 866.

## THE USE OF NAYLOR'S Aero Varnishes

**WILL ENSURE A  
PERFECT FINISH**

Many years' experience combined with up to-date methods and scientific selection of materials ensure the production of varnishes unexcelled for durability and reliability.

**Some Specialities  
for Aero Work**

Woodfillers, Stains, Air  
crew Varnish, Spar  
Varnish, Float Varnish,  
hit: Copal Finish for  
Dope, Enamels, Engine  
Paints, Etc., Etc.

Free Samples for trial  
on application.

**NAYLOR BROTHERS (London) Ltd.**  
Contractors to all Government Departments.

Offices: 407/9, OXFORD ST., LONDON, W. Works: SOUTHALL MIDD.



WHEN CORRESPONDING WITH ADVERTISERS.



Telephones:

Gosport 217.

Southampton 1861.

London: Gerrard 5716

Telegrams:

"Flight, Gosport."

"Flying, Southampton."

**GOSPORT AIRCRAFT CO.**

HEAD OFFICE: GOSPORT.

WORKS: GOSPORT &amp; SOUTHAMPTON.

Sir Charles Allom.  
Charles E. Nicholson.London Office: 15, George Street  
Hanover Square, W.1.**BLACK  
ENAMEL.****AEROPLANE  
GREY PAINT (fat).**  
Oil and Petrol  
Resisting.**TRANSPARENT  
WOOD FILLER.**Subject to  
A.I.D.  
Inspection.**HARLAND'S****VARNISHES, ENAMELS  
AND FINE COLOURS.**

By Appointment to



His Majesty the King.

**MERTON, LONDON S.W.19.**

ESTABLISHED 1791.

**OPAL  
VARNISHES  
for  
AIRSCREWS  
and  
EXPOSED  
WOOD PARTS,  
&c.****WHITE DOPE  
RESISTING PAINT.**Subject to  
A.I.D.  
Inspection.

BENCH

**TANGENT  
SHEET METAL SHEARING  
APPLIANCES**

PATENT

Self - Feeding. Fast - Cutting.

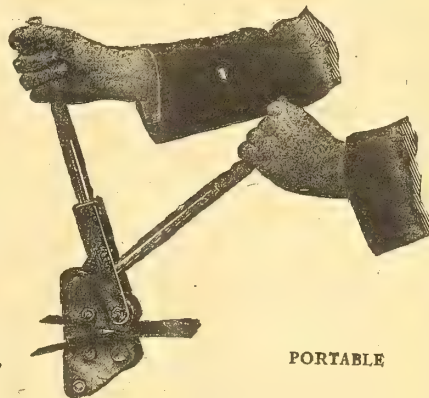
Blocks illustrate a combined portable

and bench tool for sheets up to 3/32"

□ steel, and 1/8" softer metals. □

Other types also made, including port-

able hand tools for Corrugated Iron.

WRITE FOR DESCRIPTIVE PAMPHLET  
**MONTGOMERY, SMITH & CO. LTD.**Patentees and Manufacturers,  
TANGENT WORKS, KEYNSHAM, SOMERSET.

PORTABLE

**R. F. & F. W. BROWN**

(F. W. BROWN.)

Wollaton Saw Mills  
Near Nottingham**ENGLISH ASH FOR AEROPLANES**  
**Bent Timber Manufacturers.**

Telephone .. 1526 Nottingham.

Telegrams .. Browns, Sawmills, Wollaton.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



bombs, and then no more than two. Both fell in an open street, and their effect was partly nullified by their striking a heap of snow. One bomb, however, killed three and wounded ten persons. An old woman and a child were among the killed.

The other bomb is reported to have killed a group of half a dozen Red Guards. After all the fusillading that Petrograd has been undergoing repeatedly for a twelvemonth past, this latest novelty has passed almost unnoticed.

The populace indeed seems to doubt that they were German aeroplanes at all, and suggest the Russian explanation which covers anything, namely, provocation. Certainly, on the two days I myself saw aeroplanes flying, they were low enough to distinguish any of the familiar marks of identity if there had been any, and that without a glass. Somebody certainly holds the master key to all those inexplicable phenomena which have multiplied of late.

Another message from Petersburg of the same date states:— In spite of the cessation of hostilities declared by the enemy, a German aeroplane appeared over Petrograd at five this afternoon and dropped bombs. Aeroplanes were also seen over the

Nevsky Prospekt. The belief is that the enemy was aiming at the Nicholas Railway Station.

Last night Zeppelins were observed at Gatchina (25 miles south), flying towards Petrograd. Batteries near Petrograd opened fire, and it is reported that the Zeppelins were driven off. The casualties in to-day's raids have not been ascertained.

#### A POLICE COURT CASE.

At Marlborough Street Police Court on March 9th, before Mr. Mead, John Wiekens, 22, wearing the uniform of a captain in the R.F.C., was sentenced to 12 months' imprisonment with hard labour for stealing money and other articles belonging to officers from the South African Officers' Club, Grosvenor Square. It was stated that Wiekens, who had no right to wear the uniform, was a deserter from the South African Forces.

#### CONGRATULATIONS.

PICKLES.—On March 6th, at 35a, Dennington Park Road, N.W., the wife of Flt. Lt. Sydney Pickles, R.N.A.S. (retired), of a son.

## OFFICIAL ACCEPTANCE TESTS

### LAND MACHINES.

S.P.A.D.	Avro
Sopwith	Armstrong-
B.E.	Whitworth
Short	D. H. A.
Curtiss	Handley-Page
Mann. Egerton	Bristol
M. Farman	Vickers
H. Farman	Nieuport
Morane	Supermarine, &c.

### SEAPLANES.

Short, Sopwith, America Boats, F.B.A. Boats, Curtiss Boats, Norman-Thompson, A. D. Boats, &c.

*Private Aerodromes  
Surveyed and Pilots'  
Reports Furnished.*

### DELIVERY AND EXPERIMENTAL FLIGHTS ON LAND MACHINES & SEAPLANES.

COMPLETE REPORTS FURNISHED.

Rates on application to

THE  
**PRODGER - ISAAC**  
AVIATION COMPANY  
(C. B. Prodger and Bernard Isaac),  
166, Piccadilly, London, W.1.

Telephone: Gerrard 278 (2 lines.)

Telegrams: "Aeromnia, Piccy, London."

### CLIFFORD B. PRODGER

J. LANKESTER-PARKER,  
and other Pilots.

Approved Admiralty Pilots  
—for Acceptance Trials.—

### INSURANCE.

WE are now in a position to quote low rates, through our brokers at Lloyd's, for the Insurance of Aircraft during ACCEPTANCE TRIALS AND DELIVERY FLIGHTS with an excellent and most comprehensive Policy. May we quote you for your new contracts?

SPECIAL ARRANGEMENTS with Sub-Contractors for HANDLEY-PAGE Type Land Machines or "AMERICA" Type Flying Boats

## A.G.S. WASHERS

Wire  
Work.

## THIMBLES

## UNION NUTS & NIPPLES.

Turn Buttons.

Eyelets.

Washers.

Tel.: 550 Central

Tel. Ad.: BRISK, BHAM.

**W. H. BRISCOE & Co., Ltd.,**

51, 52, 53, PARK STREET,

BIRMINGHAM.

Are YOU interested in Flying? If so, why are YOU not taking

The Nottingham Flying and

Correspondence Schools, Ltd., Course?

The Imperial Flying Service Pilots say it is the Best in the Country.

Write for Particulars and Illustrated Book issued Free.

CASTLE MEADOW ROAD, NOTTINGHAM.

'Phone 5766.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



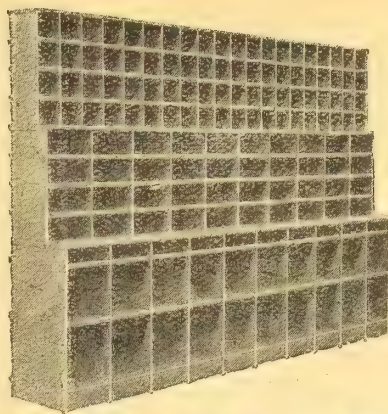
# UNDERCARRIAGES

WE can deliver promptly all types of UNDERCARRIAGES (Bristol, Avro, etc., etc.). Can we help you? Please send us your enquiries.

**THE RIVERS ENGINEERING CO., LTD.**

(CONTRACTORS TO THE AIR BOARD),  
27, LOTS ROAD, CHELSEA, LONDON, S.W.10.

Telephone: KENSINGTON 3116.



# SANKEY

**Fireproof Steel Storage Bins**

Clothes Lockers : Tool Chests.

Write for details:

Joseph Sankey & Sons, Ltd.,  
Hadley Castle Works,  
WELLINGTON, Shropshire.

*Of special interest to Government Contractors.*

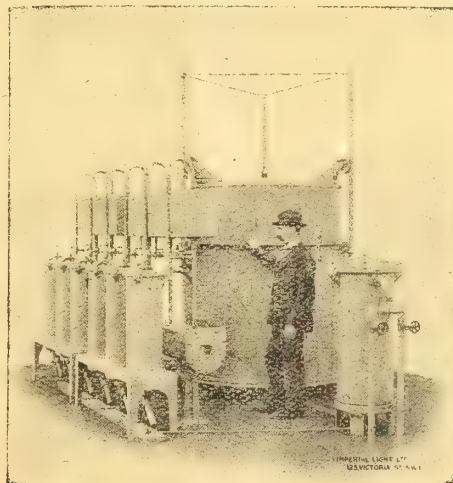
**J.B. BROOKS & CO.**

Contractors to the Admiralty, War Office, Air Board, Ministry of Munitions, etc.

And the Leather Specialists with the Largest Works, Finest Equipment, Best Facilities, and widest experience in the Trade, invite enquiries for Articles, Parts, Fitments, and Cases of

# LEATHER

*J.B. Brooks & Co. Ltd.  
104 Criterion Works  
Birmingham.*



Class 5 Imperial Acetylene Welding Plant.

**OXY-ACETYLENE PLANTS**

**IMPERIAL LIGHT LTD.,**

123, Victoria Street,

**LONDON, S.W.1.**

Telegram—  
“EDIBRAC,  
PHONE,  
LONDON.”

Telephone—  
VICTORIA  
**3540**  
(3 Lines)





**STANLEY AVIATION Co.**

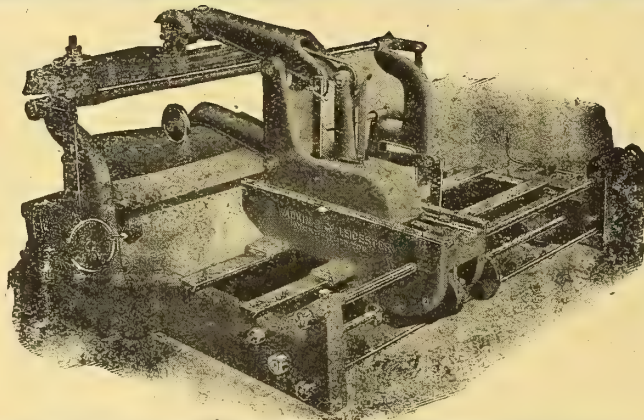
PROPELLERS, FUSELAGES,  
PLANES, RUDDERS, FINS, SKIDS ETC.

CHATHAM PLACE, MORNING LANE, HACKNEY, E.9.

THE  
TEL. 45.  
DALSTON

**AUTOMATIC  
PROPELLER  
SHAPER  
K.E.**

As supplied to all the  
leading propeller  
makers.



Every blade identical.

Less balancing required

Saves labour.

Increases output.

Write for list of users.

**WADKIN & CO  
LEICESTER.**

Telegrams: "Woodworker."  
Phone: 3614/5.

**"NOVELLON" DOPE  
AND AEROPLANE VARNISH.  
CELLULOSE ACETATE & CHEMICALS**

**BRITISH CELLULOSE & CHEMICAL MANF'G.  
COMPANY, LIMITED.**

Telegrams:

Cellutate, London.

8, WATERLOO PLACE, S.W.1.

Phone: Regent 4045.

Works: Spondon, Derby; and Maybury Gardens, High Road, Willesden Green, N.W.10.

(Telephone: Willesden 2380.)

**THE AIRCRAFT CONSTRUCTION CO.**

EVERY DESCRIPTION OF METAL COMPONENTS.

**Immediate Delivery of SE SUMPS.**

**HARLEY AEROPLANE WORKS, Beckton Rd., E.16**

Telegrams: "Aercracons," Canning, London.

Phone: East 1300.



# LEARN TO FLY

— AT —

## Bournemouth.

— THE —

**LARGEST AND MOST UP-TO-DATE  
CIVILIAN SCHOOL IN ENGLAND.**

*Immediate Vacancies.*

*Run under Rules approved by the Royal Aero Club.*

**RAPID TUITION.**

**43 Caudron Service Biplanes (Solo & Dual Control).**

**SPECIAL TRAINING**

for Pupils intending to enter the R.F.C. or R.N.A.S.

**APPLY :**

**Bournemouth Aviation Co., Ltd.,**  
**AERODROME, BOURNEMOUTH.** (Phone 1160).

# PROPELLERS ONLY.



**CONTRACTORS TO  
H.M. GOVERNMENT**



**Office & Works—**  
**Propeller Works,**  
**Balm Road,**  
**Hunslet,**  
**Leeds.**

**Telephone—**  
**Central 291.**  
**Telegrams—**  
**Aircscrews, Leeds.**

Contractors to H.M. Government.

# SWIFT AVIATION CO.

**Dolphin Engine Plates in Stock,**  
**Complete Sets.**

*Speciality Sopwith Spares.*

# KINGSTON

**PHONE—**  
**762 KINGSTON**

**'GRAMS—**  
**"SWIFT, KINGSTON"**

# BRIGHT BOLTS & NUTS



(Suitable for Every Description of Engineering Work)  
**QUALITY, ACCURACY AND FINISH GUARANTEED**

**THE**  
**"HELICOID" LOCK-NUT**  
(THE FINEST LOCK-NUT IN THE WORLD.)

**This nut will remain secure, no matter how great  
the vibration may be—in fact vibration actually  
tightens the grip.**

(made from 1/2 in.  
to 2 1/2 in.)



(sample nut & prices  
on application)

**We also manufacture Wrought Iron Railing and Gates, etc.**

**BAYLISS, JONES & BAYLISS**  
**LTD.**  
**WOLVERHAMPTON.**

**London Offices: 139/141, CANNON ST., E.C.4.**



Telegraphic Address: POETRY, 'PHONE LONDON.  
Telephones: AVENUE 995, 996, 7996.

(Partners:  
H. W. PRITT,  
W. G. PRITT,  
P. W. SMALLWOOD,  
E. R. HILL),

## PRITT & CO.

METAL WAREHOUSEMEN, MUNITION  
AND AERONAUTICAL CONTRACTORS

46, FENCHURCH STREET,  
LONDON, E.C. 3,

Where all communications must be addressed.

CITY WAREHOUSES: 62a, Vine Street, Minorities, E.  
9, Jewry Street, Aldgate, E.C.  
DEPOTS: Paddington, Poplar, Shoreditch.

We hold good stocks, complying with Air Board, R.A.F.  
and Admiralty Specifications, of the following:

BRASS & COPPER in sheets, tubes, rod, wire, etc.  
TINNED STEEL SHEETS.  
MILD STEEL SHEETS, 9a.  
BRIGHT DRAWN MILD STEEL BARS, 3a.  
A. G. S. BOLTS, NUTS AND WASHERS.  
COPPER RIVETS. TINMAN'S SOLDER.  
SOLDERING IRONS.  
BEST SWEDISH WELDING WIRE.  
BRAZING SOLDER in wire and granulated form.  
SILVER SOLDER. WIRE GAUZE, &c.

All material passed A.I.D. before despatch.

DAILY DELIVERIES made by our own vans within a radius of  
15 miles of our Warehouses.

NOTE.—All orders for Aeronautical Work receive especially  
prompt attention.

WE ARE BUYERS OF SCRAP BRASS & COPPER.

CONTRACTORS TO H.M. GOVERNMENT

## W.T. CLARK & CO.

Telephone  
No.  
Central  
2121.

5, GREEN TERRACE,  
ROSEBERY AVENUE,  
LONDON, E.C.1.

Telegrams  
Etalspinne  
Isling London.  
Two Words

### METAL SPINNERS

and

### SHEET METAL WORKERS

for Aeroplane Constructors

METAL SPINNINGS for AEROPLANES

Cowlings (COMPLETE SET)

Coverings

Undershields

Fairings

Petrol Tanks

Shields etc.



BEATEN COWLS

OF EVERY

DESCRIPTION

SPUN COWLS

UP TO

48 INCHES

IN DIAMETER.



## CHAUVIÈRE'S Integral Propellers



are used more extensively than  
any other Propeller in  
the World.

Hold all Records and are  
indisputably the best.

Maximum Efficiency.

Best Workmanship.

THE INTEGRAL PROPELLER CO., LTD.

Edgware Road, The Hyde, Hendon, N.W.9.

Telegrams: "Aviprop, Hyde, London." Telephone Kingsbury 104.

## THE BRITISH WRIGHT CO. LTD.

Owners of the British, Italian and Belgian Patents  
of Wilbur and Orville Wright.

Manufacturers of  
**AERONAUTICAL  
INSTRUMENTS**

FOR

NAVY & ARMY AEROPLANES

Ogilvie Air Speed Indicators

For use on Aeroplanes, Airships, Kite  
Balloons and Air Stations.

Statoscopes.

Recording Manometres.

Wind Speed Recorders.

At present the Government is taking the entire output, but  
British and Foreign Firms are invited to place their orders  
now for delivery of Aeronautical Instruments after the war.

The BRITISH WRIGHT Co. Ltd.

33, CHANCERY LANE, LONDON, W.C.2.



# HEATING AND VENTILATION

DOPE SHOPS, AERODROMES,  
AND AIRCRAFT FACTORIES.

**WHEELER & SONS,** Phone—  
PARK 652.  
1a, VICTORIA GARDENS, LONDON, W.11.

# THE POOLE AVIATION CO. POOLE, DORSET.

*Contractors to H.M. Government.*

**Spares and all Parts of Machines.**

**ENQUIRIES INVITED.**

'Phone: Poole 54.

'Grams: Aviation, Poole.

# HEATING, DRYING AND VENTILATION.

**Kinnell's**

OF DOPE SHOPS, AERODROMES AND  
AIRCRAFT FACTORIES, &c. OF EVERY  
DESCRIPTION. List 1134 free.

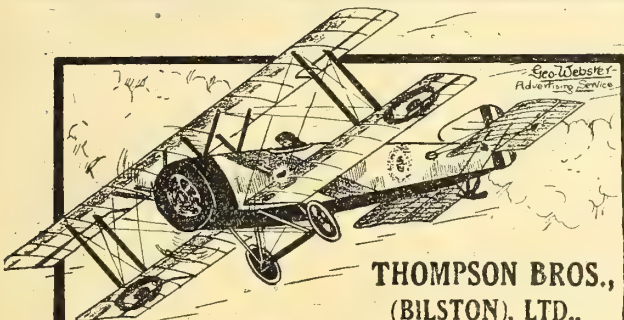
**C. P. KINNELL & CO., LTD.** Phone—  
Hop 372  
65, SOUTHWARK ST., LONDON, S.E.1.

WE HAVE INVENTED

# THE NON-EVAPORATING DOPE POT

ARTHUR HILL & Co.,  
SHEET METAL WORKS,  
SILCHESTER ROAD,  
LONDON, W.10.

Phone—1443 PARK.



**THOMPSON BROS.,  
(BILSTON), LTD.,**

— FOR —  
**UNDERCARRIAGES  
TUBULAR FRAMEWORK  
AERO. DEPT. BILSTON, Staffs.**

# Aeroplane Steel Sheets

as supplied by us to

**The Royal Aircraft Factory  
and leading Aeroplane Makers**

Guaranteed to comply with the R.A.F. No. 9A  
specification. Stocked in all gauges. (Sheets  
are passed and stamped by the "A.I.D.")

**BERNARD NICKLIN & CO.  
IRON AND STEEL WAREHOUSE  
SMETHWICK, BIRMINGHAM**

Telegraphic Address:  
"Bernico," Birmingham.

Telephone No. 1  
224 Smethwick.

# THE SIBERIAN & GENERAL TRADING CO., LTD.

Can supply from stock or for prompt shipment

# PLYWOOD

IN ALL WOODS, SIZES AND THICKNESSES.

**SPECIALITY: BOARDS FOR AIRCRAFT WORK.**

**HEAD OFFICE: 33, BISHOPSGATE, LONDON, E.C.2.**

Telegrams—Wolosey, Led, London.

Telephone—London Wall 3577.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# THE "BOWSER" AEROPLANE SEATS

(Made to A.G.S. Drawing 264).

Supplied to the Royal Aircraft Factory and the Leading Aircraft Manufacturers.

Manufactured by **EDWARD BOWSER, 50, Park Lane, Leeds.** Tel. No.: Central 3473.

Under the A.I.D. Inspection.

Northern Representative—  
Mr. **WALTER M. DANIELL,**  
33, East Beach, Lytham.

## HIDE GLUES *FOR AIRSCREWS AND AIRCRAFT CONSTRUCTION.*

— APPROVED —

Manufacturers—**Wm. OLDROYD & SONS, Ltd., 9, Mincing Lane, London, E.C.3.**

Telephone: 4978 Avenue

## RUBBER PETROL RESISTING HOSE, TUBING & CONNECTIONS

WASHERS, RINGS, BUFFERS, SHEET. STRIP, MATTING, MOULDINGS.

**JAMES LYNE HANCOCK, Ltd., 266, Goswell Rd., London, E.C.1**

PHONE  
CITY 3811  
3812

**EBORA**  
PROPELLER  
Company  
112, 12 Surbiton Park  
Terrace, KINGSTON  
on Thames  
Telephone  
KINGSTON 672  
Telegrams  
EBORA, KINGSTON

# Ebora Propellers

Contractors  
to the Admiralty  
and War Office  
SCHOOL PROPELLERS  
FOUR BLADES  
SEAPLANE PROPELLERS  
SLATE TABLES FOR  
PROPELLER WORKS

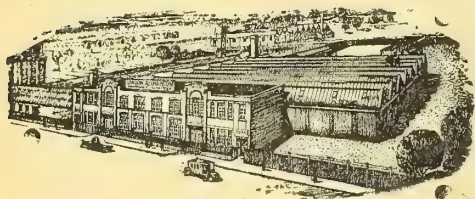
Telephone—East 3833.

## THE STANDARD Aircraft Manufacturing Co., Ltd.

28, BOW COMMON LANE, LONDON. E.3.

## Lang Propeller LTD.

Contractors to  
the Admiralty  
and War Office.  
**WEYBRIDGE,  
SURREY.**



## PRESS-WORK & SPINNINGS

and Sheet Metal (War) Work generally.

The **LONDON ALUMINIUM Co., Ltd.,** Aircraft Dept.,  
Westwood Road, Aston, B'ham. Phone: East 497.

## CRADOCK'S STRANDS & CABLES

Manufactured from Tinned Steel Wire of the Highest Quality.  
CONTRACTORS TO HIS MAJESTY'S GOVERNMENT.**GEO. CRADOCK & CO., Ltd.,** Head Office **WAKEFIELD.** London Office:  
and Works: 7, East India Avenue.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



Manufacturers  
of

**PHOSPHOR BRONZE,**

**GUN METAL,**

**MANGANESE BRONZE,**

**BRASS & COPPER,**

TUBES, SHEETS,  
RODS, WIRE, AND

**CASTINGS.**

PHOSPHOR TIN,  
PHOSPHOR COPPER.

**CHARLES CLIFFORD & SON, LTD.,**  
**BIRMINGHAM.**



**CLABOUR-WESTBAY**

“ FOR ”

**2.B.A. Bolts—A.G.S. 103**

Entire Output at present absorbed  
—by Government Requirements.—

**W. A. Clabour, Westbay & Co.,**  
**KIRKSTALL, LEEDS. Ltd.**

Phone; Headingley 709.

Telegrams: Clabour, Kirkstall.

**SALMSON**  
**AERO-ENGINES**

(Canton-Unné System).

All enquiries should be addressed to

**THE DUDBRIDGE IRON WORKS, L<sup>d</sup>.**  
**STROUD,**  
**GLOUCESTERSHIRE.**

London Office:

87, Victoria Street, S.W.1.

*The Air Navigation Co., Ltd.*

**BLERIOT & SPAD**  
**AIRCRAFT WORKS,**  
**ADDLESTONE (SURREY).**

**Contractors to War Office and**  
**Admiralty.**

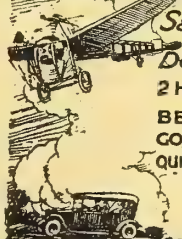
**Flying Ground — Brooklands Aerodrome.**

**NORBERT CHEREAU, Managing Director.**

Telegrams—Bleriot, Weybridge.

Telephone—353 Weybridge.

**Aluminium**  
**Castings**



*Sand or Die*  
*of every*  
*Description*  
2 HP to 600 HP  
BEST METAL  
GOOD CASTINGS  
QUICK DELIVERIES

Contract to  
H.M. Government  
**Chill Castings for**  
**Aeroplanes a Speciality**

Telephones: 3846 City. 4879 Central. Telegrams: Kramkasa, Isling, London

**R W COAN**  
*The Aluminium Foundry*  
219, COSWELL ROAD,  
LONDON, E.C.

COAN  
CASTS  
CLEAN  
CRANK  
CASES

**Berling Magneto**  
**insures a hot, fat**  
**spark at any**  
**altitude**

Worth more  
Does more



Manufactured  
by the  
**Ericsson Mfg. Co.**  
**Buffalo N.Y. U.S.A.**

**“ CROID ”**  
**LIQUID GLUE**

Adopted by  
H.M. Admiralty, etc.  
Sole Manufacturers:  
**The Improved Liquid**  
**Glues Co., Ltd.,**  
Gt. Hermitage Street  
London, E.  
Contractors to H.M.  
Government.





## TRADE CARDS.

## AEROPLANE TIMBER SPECIALISTS

**JOSEPH OWEN & SONS, Ltd.,**  
**Borough Saw Mills, LONDON, S.E.**

Telephone: HOP 8811 Telegrams: "BUCHERON, SEDIST."

## Advertising

For GOOD ADVERTISING consult  
 Godbolds, 8, Breams Buildings,  
 London, E.C.4. Estimates Free.  
 Phone: City 6912. E. H. Godbold,  
 Director



## JAMES NORTH HARDY &amp; SON, LTD.,

54, PORTLAND STREET, MANCHESTER,  
 MANUFACTURERS of all descriptions of COTTON and LINEN  
**WEBS, TAPES & TWINES FOR AIRCRAFT  
 AND ELECTRICAL WORK.**

London Branch: 3, FITCHETT'S COURT, NOBLE STREET, E.C.4.  
 Mills: HEATON PARK, nr. MANCHESTER.  
 Tel. Add.: "Hardson," Manchester. Phone: No. 6471 Central.

## FREDK. WARD

— FOR —

## Aero Engine and Gun Gear Parts

ALSO PATTERN AND JIGS.

**ALLSOP ST., UPPER BAKER ST., N.W.**

Phone: Paddington 4743.

## NAME PLATES.

WE SPECIALISE IN EVERY DESCRIPTION OF  
 NAME PLATES IN METAL, VORINE, ETC.

**CLEGG METAL ENGRAVING CO.,**  
 CHATSWORTH WORKS, WORTHING.

## ALWIN ENGINEERING CO., AERONAUTICAL ENGINEERS.

A. E. CARTLIDGE.

L UTHUR ROAD, TEDDINGTON, S.W.

Tel. No. Kingston 2412.



Makers of all kinds of Aircraft Fittings.

Presswork a Speciality.

Pressings for DeH, etc.

Avro, Sopwith, Fairey and many other types.

On receipt of Post Card our Representative will call and  
 give immediate quotation.

## Springs! Springs! Springs!

We make a speciality of  
 Springs for Aeroplanes.  
 SEND FOR PRICES.

**Dart Spring Co., West Bromwich.**

## SAVE TIME.

## H. DUNSHEATH &amp; CO.,

Makers of Every Description of  
 STEEL MARKS, DIES, LETTERS, FIGURES, BRASS  
 STAMPS AND IRON BRANDS.

Seals, Brass, Tin and Zinc Labels, Time Checks, Stenoll  
 Plates, Brass Name Plates, Rubber Stamps, &c.

**30, ARUNDEL STREET, SHEFFIELD.**

Clean Coloured Rags  
FOR CLEANING & WIPING.

Best and Cheapest for Munition Works ::  
 Engineers, Printers & Bus Companies, etc.

**A. JOSEPH, EARL STREET, LONDON ROAD,  
 LONDON, S.E. 1.**

Telephones: Hop 83, 361 & 4272.

"Cheaper than cotton waste."

## P.D.V. Aircraft Company, Ltd.

All Metal Parts for Aircraft made, comprising the  
 following machine work: **Milling, Turning,  
 Shaping, Press Work, Slotting, Drilling, Grinding and  
 Sheet Metal Work.** Well-equipped Welding and Brazing Plant.

Enquiries to - **P.D.V. AIRCRAFT COMPANY, Ltd.,**

Offices & Works: **Princes Street, Richmond, Surrey.**

Telegrams: Asres, Richmond.

Telephone: 1661 Richmond.

## Chauvière's famous Integral Propellers

HOLD ALL RECORDS; USED BY ALL  
 LEADING AVIATORS. THE BEST

Sole Proprietors for Great Britain and Colonies

**THE INTEGRAL PROPELLER CO., LTD.,**

Edgware Road, The Hyde, Hendon, N.W. 9.

Telephone—Kingsbury 104. Telegrams—"Aviprop, Hyde, London."

## EBORA PROPELLER COMPANY LTD

*Ebora*

## PROPELLERS

Contractors to the ADMIRALTY & WAR OFFICE  
 11 & 12 SURBITON PARK TERRACE, KINGSTON-ON-THAMES

Telephone: KINGSTON 672

Telegram: "EBORA, KINGSTON"

SCREW-DRIVING  
RUSSELL BROTHERS, Ltd., REDDITCH  
MACHINES.

Trade **MENDINE** Mark.

## LIQUID SCOTCH GLUE

USED BY THE LEADING AEROPLANE CONSTRUCTORS.  
 MOISTURE PROOF.

Write for Prior List and Particulars

**MENDINE CO., 8, Arthur Street, London Bridge, E.C.**



# SHENSTONE & Co., AIRCRAFT DEPT., GRANGE ROAD, LEYTON.

Owing to our constantly increasing output we have vacancies for First Class Hands in the following Departments.

**WOODWORKERS.  
PATTERN MAKERS.  
MALE CARPENTERS & JOINERS.  
SPINDLE HANDS.  
JIG MAKERS.**

**FEMALE**

**COVERING.  
RIB MAKING.  
SEWING.  
VARNISHING.  
DOPING.**

General Manager—E. KEITH DAVIES.

Telephone—Walthamstow 24.

## MISCELLANEOUS ADVERTISEMENTS.

### SITUATIONS WANTED—Continued.

Purchasing Agent with fifteen years' experience of all branches of engineering trade requirements, used to control of purchases on large scale, capable organiser, is now open for re-engagement with large firm on Government work. Unquestionable references.—Box No. 3424, THE AEROPLANE, 166, Piccadilly, W.1.

### AVIATION

#### AVIATION INSTRUCTION

on up-to-date lines, by a qualified Engineer in Aeronautics. Demonstrations from complete set of parts, and sectioned models.

Send for Prospectus No.1.A.,

THE MOTOR TRAINING INSTITUTE LTD.,

10, Heddons Street, Regent Street, W.1.

### AIRCRAFT PARTS.

**Hardwood for Aeroplanes.**—Specially Selected air-dried timber as supplied to leading constructors in Britain and the Continent. Silver Spruce, Ash, Poplar; Hickory and Ash Skids; Three-ply; Thin Cedar and Mahogany for Floats; Walnut for Propellers.—William Mallinson and Sons, Ltd., Hackney Road. Phone, 3845 Central, 4770 Wall.

**Tapes, Webs, Cords and Threads** in all qualities, suitable for Aircraft Work. Delivery from stock.—John MacLennan and Co., 30, Newgate Street, London, E.C.1. (See Advertisement Page 1031 and Buyers' Guide).

**Aeroplane Seats** to any drawing or specification. Prompt deliveries.—F. C. Chappell, Cane Works, 9, Fisher Street, Nottingham.

**Aeroplane Seats.** We can give quick delivery of cane seats, A.G.S. 264 or other patterns, guaranteed pass inspection. Write us for anything required in cane work.—The Willowbrook Company, Leicester.

**Bolts and Eye Bolts.**—We can make quick delivery of bolts and eye bolts of every size, and send quotation on demand.—R. L. Dubois and Co., Aeronautical Engineers and Manufacturers, 673, Romford Road, Manor Park, E.12.

### WANTED.

**Wanted Woodwork** for aeroplanes, very large up-to-date factory, fully equipped with latest machines; any class of aircraft work undertaken; prompt deliveries; best work.—Apply Box 3030, THE AEROPLANE, 166, Piccadilly, W.1.

**A quantity of 1/16 in. three-ply birch cuttings** required. Sizes must not be less than 4 ins. by 1 ft.—Ruffy Aeroplane Co., Noel Road, Acton, W.3.

**Engineering Firm** with well-equipped machine shops, now engaged on munitions, solicits inquiries for all classes of turning, drilling, grinding, milling, fitting, etc. Aircraft fittings, also copper pipe work, a speciality. Correspondence with a view to post-war business especially invited.—The Lankester Engineering Co., 39, Eden Street, Kingston-on-Thames.

**Glue Wanted** in any quantities for joinery and cabinet work. State cash price. London.—"J," Box 142, Spottiswoode's, Kingsway Hall, W.C.2.

**Wanted Aeroplane Propeller Cuttings,** mahogany and walnut. Any amount for cash.—Box No. 3423, THE AEROPLANE, 166, Piccadilly, W.1.

**Sheetmetal and Coppersmiths' work wanted.**—Midland firm is open to receive inquiries for tanks, sockets, fairings, and pipework, etc. Best work and prompt deliveries guaranteed.—Box No. 3415, THE AEROPLANE, 166, Piccadilly, W.1.

**Plating and Polishing.**—We undertake any kind of nickel, copper, tin or brass plating. Mat or bright finish. Copper or steel tube Bending and Brazing.—Mona Plating Works, Barretts Grove, Stoke Newington, N.16.

**Wanted,** by small Works in North London, work from end of March; 40 machines; various, bar work up to 2 in., accuracy and steady output guaranteed. Preparation could commence immediately.—Box No. 3410, THE AEROPLANE, 166, Piccadilly, W.1.

**Wanted,** Sheet Metal Work and Oxy-Acetylene welding combined, high-class workmanship and prompt delivery.—Manwood, Miller and Co., Dukinfield.

**Wanted,** firm having machines available, also Die heads with High Speed Dies, could undertake fairly large quantities of threading work in 1/4-inch, 9/32-inch and 5/16-inch B.S.F. Right and left-hand threads.—Box No. 3438, THE AEROPLANE, 166, Piccadilly, W.1.

**Aeronautical Text Books** required; second hand. Give title and lowest prices accepted.—Box No. 3437, THE AEROPLANE, 166, Piccadilly, W.1.

**Aircraft Firm** would co-operate with small engineering works (London preferred) suitable manufacture Aircraft Parts. Would place orders and give financial assistance, or purchase.—Reply, immediately, to Box No. 3429, THE AEROPLANE, 166, Piccadilly, W.1.

### ENGINEERING.

**British School of Aeronautics.**—Aircraft Engineering Course; Aero Design; Aero Construction; Aero Draughtsmanship; Mechanical Engineering.—Pennington's, 254, Oxford Road, Manchester.

### FOR SALE.

**Naval Officer's Blue Burberry Tielocken,** silk lined, 44-inch chest; new condition; 45s.—Barton, Aston Villa, Burton Joyce, Notts.

**Flying School for Sale,** going concern, fully equipped, aerodrome, workshops, etc.—Box No. 3426, THE AEROPLANE, 166, Piccadilly, W.1.

### PUBLICATIONS.

**Glossary of aeronautical words**, and phrases with diagrams and illustrations, English French terms, metric equivalents. Invaluable to those interested in aircraft. Price, 1s. net, from Aircraft, 69, Bishopsgate, E.C.2.

### MISCELLANEOUS.

**Luminous paint** for wrist watches, clocks, match boxes, etc.; remains luminous for years. Bottles 1/9 and 2/9.—Tobin & Co., 39, Charles Street, Hatton Garden, E.C.

### MAKE MONEY BY WRITING.

**£50 PRIZE.** Send postage (2d.) for particulars and copy of "How to Earn Money while Learning How to write for Newspapers and Magazines." Practical and Comprehensive Correspondence Courses—Fiction and Articles, etc. Expert Literary Directors. Constructive Criticism. Beginners taught how to make work saleable. Exceptional testimonials. Address "Editorial" (Dept. E.M.), 22, Chancery Lane, London, W.C.2.

### MODELS.

**Model Aeroplane,** flies 1/4 mile circular flight, carriage paid, 3s. 4d. "I can thoroughly recommend your machines." Testimonials from Dr. Adams, Union Road, Sheffield. Thousands satisfied, testimonials from all parts.—Dept. C., Bristol Model Aeroplane Depot, Eastville, Bristol.

**T. W. K. Clarke and Co., Ltd.,** Model Department, Hampton Wick.—Though we are full up with full-size aeroplane parts orders, we still build models as we did in 1906. Sopwith Biplanes, etc., in stock.—Send 3 stamps for our illustrated List, 120 items and 14 models; certain metal goods are out of stock.



## MISCELLANEOUS ADVERTISEMENTS.

**SPECIAL PREPAID RATE:** 18 words 1/6; Situations Wanted ONLY, 18 words 1/-; 1d. per word after. **TRADE ADVERTISEMENTS** in these columns, 3 lines 3/-; 10d. per line after. Public Announcements, Legal Notices, Auctions, Contracts, etc., 1/6 per line. For the convenience of Advertisers, replies can be received at the offices of "THE AEROPLANE" 166, Piccadilly, London, W.1.

## PATENTS.

**\*AGE & ROWLINSON**, Chartered Patent Agents (Consulting Engineer, Mr. S. E. Page, A.M.Inst.C.E.), 27, Chancery Lane, London, W.C. Tel. 332 Central.

**Henry Skerrett**, Chartered Patent Agent, 24, Temple Row, Birmingham.—Patents, trade marks, and designs.

**Inventors advised free.** Write for booklet.—King's Patent Agency, Ltd., 165, Queen Victoria Street, London. 30 years' references.

**Stanley, Popplewell and Co.**, Patent Agents and Consulting Engineers. Applications for Patents attended to in all countries.—38, Chancery Lane, W.C. Telephone: 1763 Central. Circular free.

## SITUATIONS VACANT.

**A Large Firm**, London, N.W., has several vacancies for aeroplane erectors and assemblers, used to accurate and high-class aeroplane work. No one living more than 10 miles away or engaged on Government work need write to Box 3360, THE AEROPLANE, 166, Piccadilly, W.1.

**Aeroplane Draughtsmen**.—Wanted by old established aeroplane manufacturers several first-class draughtsmen, with previous experience of aeronautical work preferred.—Apply, with full particulars of qualifications and salary required, to your nearest Employment Exchange, mentioning this paper and No. A4697. Men on Government work need not apply.

**Viewers**, experienced in aircraft fittings, required for large aircraft factory, Southern district. No one on Government work need apply.—Applications, with full particulars of experience and previous employment, should be addressed to your nearest Employment Exchange, mentioning this paper and No. 3397.

**Smart Man** wanted for buying department, preferably one with aeroplane or motor experience; good opportunity for capable man. No one on Government work need apply.—State age, salary, and experience to nearest Employment Exchange, mentioning this paper and No. 3402.

**Capable Costing Clerk**, with knowledge of drawing and blue prints, required for aircraft works. No one on Government work need apply.—Write Box No. 360, Smith's, 21, Bush Lane, E.C.4.

### AIRCRAFT WOODWORKERS. WANTED 250 FOR LONDON DISTRICT. URGENT GOVERNMENT WORK.

Highest district rates, plus premium bonus. Only first class skilled and Union men need apply.

No person residing more than 10 miles away or engaged on Government work need apply.

Write, stating experience, to Box 205, Sells, Ltd., 168, Fleet Street, London, E.C.4.

**Foreman of Aero-engine Assembling Shop**, near London; must be live man with previous experience. No one on Government work need make application.—Apply, giving full particulars of qualifications and salary required, to your nearest Employment Exchange, mentioning this paper and No. 3435.

**Wanted Machinists and Joiners** in West sea-side town for Aircraft work. No one on Government work need apply.—Apply nearest Employment Exchange, mentioning this paper and No. 3433.

**Assistant Works Manager** required by firm on South Coast engaged entirely on Aeroplane Spares. No one already engaged on Government work need apply.—State experience, age, salary required, to your nearest Employment Exchange, mentioning this paper and No. 3421.

**Engineer or Manager** required by firm starting Metal Working department for Aeroplanes. Knowledge of estimating cost essential, and able to take entire charge of department. No one already engaged on Government work or resident more than ten miles away need apply.—Write Box 59 at Horncastle's, 60, Cheapside, E.C.2.

**Aeroplane Designer** required for Government controlled establishment situated in Eastern Counties. An excellent opportunity offered to man with first-class knowledge of detail design. Must be thoroughly competent, quick and accurate draughtsman.—Apply, stating age, experience and salary required, to your nearest Employment Exchange, mentioning this paper and No. 3430. No one already on Government work will be engaged.

**Required immediately** one or two Experienced Lady Tracers for Willesden district. No one employed on Government work need apply.—Box No. 3432, THE AEROPLANE, 166, Piccadilly, W.1.

**Storekeeper** required by firm on South Coast. Used to aircraft metal parts, etc.—State experience, age, salary required. No one already engaged on Government work need apply. Applications must be made through your nearest Employment Exchange, mentioning this paper and No. 3422.

## RADIATOR AND SHEET METAL WORK UNION WORKMEN (BEST RATES PAID) WANTED

No one already on Government work or resident more than ten miles away, will be engaged.

Apply—

**GALLAY RADIATOR CO., LTD.**  
198, Gt. Portland Street, W.3

**Departmental Manager** required for precision work, with knowledge of modern methods of production in large quantities, and the necessary piece work methods to give satisfactory costs. Experience with the heat treatment of steels important. Thorough control of both male and female labour absolutely essential. No person already on Government work will be engaged.—Apply your nearest Employment Exchange mentioning No. A4851.

**Superintendent of Machine Shop for Turning Department.** First class man with experience in handling automatics, capstans, and chucking lathes to fine limits, and able to get maximum production from section mixed labour. No person already on Government work will be engaged.—Apply your nearest Employment Exchange, mentioning No. A4852.

**Superintendent of Grinding section of Machine Shop.** First class man with wide experience of all types of precision grinding able to get maximum production and to train and maintain operators to fine limits. Male and female labour. No person already on Government work will be engaged.—Apply your nearest Employment Exchange, mentioning No. A4853.

**Draughtsmen** and a "stress calculator" or two required in aviation works near London. Aeronautical experience and technical knowledge an advantage.—Write, stating particulars and salary required, to the Fairey Aviation Co., Ltd., Hayes, Middlesex.

**Progress and Stock Control.** Capable organiser to take charge of department in large aircraft works. No one on Government work need apply.—State experience, general qualifications, salary, etc., to your nearest Employment Exchange, mentioning this paper and No. 3420.

**Hardener** for control under chemist of specialité hardening of alloy steel, and capable of supervising a number of men and the movement of parts through shop. Knowledge of pyrometry, etc. No person already on Government work will be engaged.—Apply your nearest Employment Exchange, mentioning No. A4854.

## SITUATIONS WANTED.

**Works Manager**, or position of trust, 37, practical engineer, invaluable experience both aeroplanes and seaplanes. Tactful, energetic, methodical organiser, accustomed to latest service methods and capable of economically increasing production.—Box 3284, THE AEROPLANE, 166, Piccadilly, W.1.

**Engineer**, with London office, wishes to represent a good firm manufacturing articles in connection with the aircraft industries.—Box 3386, THE AEROPLANE, 166, Piccadilly, W.1.

**Advertiser** (25), Grade III., public school and two years' university engineering education, desires **APPOINTMENT** under Government Department or on Government work. Some recent experience in Government inspection work.—Box No. 3391, THE AEROPLANE, 166, Piccadilly, W.1.

**As Manager or Mill Foreman**, expert Joiners' Machinist, thoroughly understands the economical conversion of Lumber to meet A.I.D. requirements. Good organiser and manager of large bodies of labour. Large mills preferred. Wages, £300 yearly; progressive.—Box No. 3436, THE AEROPLANE, 166, Piccadilly, W.1.

**Advertiser seeks berth as Manager** of erecting or fitting shop; ten years' aircraft experience, aeroplane and seaplane; disengaged. Excellent references.—Box No. 3429, THE AEROPLANE, 166, Piccadilly, W.1.

**Advertiser**, 31 (discharged), desires responsible post as Buyer; three years application to special materials and parts for engines and planes. Can undertake tools and general supplies equally well. Fifteen years' experience feeding large factories. Exceptional knowledge of quick and good sources of supply. Good education, appearance and address. Energetic, capable and reliable. £350.—Box No. 3434, THE AEROPLANE, 166, Piccadilly, W.1.


**Erector Foreman**; advertiser seeks situation: ex erector Air Service, silver badge. Thorough knowledge of most types land machines from "Kites" to "Camels".—Box No. 3431, THE AEROPLANE, 166, Piccadilly, W.1.

**Buyer**, aeronautical experience in large factory; previously in motor trade, desires similar position. Organising ability, tactful, keen on production.—Box No. 3428, THE AEROPLANE, 166, Piccadilly, W.1.

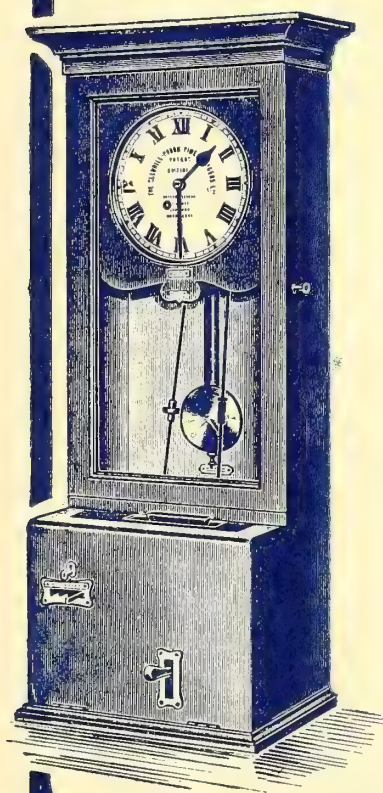
**Mechanical and Electrical Engineer** (practical) seeks situation with progressive firm; first-class experience in assembling and erecting of complete aeroplanes.—Mechanic, 20, Willington Road, Stockwell, London.

**Chief Jig and Tool Designer and Production Engineer**, open to take up position as Machine Shop Superintendent or Assistant Works Manager, or similar position. Considerable experience on repetition work and all classes of aero engine work. Practical, Engineer, well up in organising. State salary.—Box No. 3425, THE AEROPLANE, 166, Piccadilly, W.1.





*Always up to time*



THE TIME STAMPED  
ON THE CARD...  
ALWAYS AGREES  
WITH THE CLOCK

A BRITISH MACHINE  
THROUGHOUT . . . . .  
ENSURES CORRECT  
ESTIMATES . . . . .

**THE GLEDHILL-BROOK TIME RECORDERS LTD.**  
26 Victoria St LONDON, S.W. 44 Hill St BIRMINGHAM.  
43 MARKET St HUDDERSFIELD.



# WYCOMBE AIRCRAFT CONSTRUCTORS, LIMITED.

==  
HIGH WYCOMBE,  
BUCKS.  
==

Telephones : High Wycombe 84 (Stores : High Wycombe 120).  
Telegrams : "Aircraft, High Wycombe."

CONTRACTORS TO THE ADMIRALTY AND AIR MINISTRY.

# SHORT BROTHERS,

Aeroplane and Seaplane Works,  
ROCHESTER, KENT,  
— AND —  
Aircraft Works & Flying Grounds,  
— BEDFORD. —

Telephones :—

627 CHATHAM.  
261 AND 262 BEDFORD.  
788 BATTERSEA.



Telegraphic Addresses :

"SEAPLANES," ROCHESTER.  
"SHORTS," BEDFORD.  
"BALLOONING," LONDON.

London Office : WHITEHALL HOUSE, 29/30, CHARING CROSS, S.W. 1.

Telephone : 378 REGENT.

Telegrams : "TESTED, PHONE, LONDON."

EDITORIAL AND ADVERTISEMENT OFFICES, 166, PICCADILLY, W.1.

Printed for THE AEROPLANE AND GENERAL PUBLISHING CO., LTD., by BONNER & CO., The Chancery Lane Press, Rolls Passage, London; and Published by THE ROLLS HOUSE PUBLISHING COMPANY, LTD., at Rolls House, Breams Buildings, London.



# THE AEROPLANE

WEDNESDAY, MARCH 20. 1918.

Edited by  
C. G. Grey

Vol. XIV. No. 12

THREEPENCE WEEKLY

[Registered at the G.P.O.  
as a Newspaper.]

## THE NORMAN THOMPSON FLIGHT CO. Ltd.

ESTABLISHED 1909

Works—MIDDLETON, BOGNOR

Telegrams—SOARING, BOGNOR  
ENTIFLYTE CHARLES, LONDON

CONTRACTORS TO THE ADMIRALTY

Telephones—BOGNOR 48. GERRARD 7385

London Office—  
DEWAR HOUSE, 11, HAYMARKET, S.W.1.

DESIGNERS AND MANUFACTURERS OF FLYING BOATS AND LAND PLANES

**Auster** FOR **Aero-shields**  
LONDON. BIRMINGHAM

**BEARDMORE** A E R O  
ENGINES

**TITANINE**  
NON-POISONOUS  
**DOPE** SEE ADVERT. INSIDE.

TELEPHONE:  
OLDBURY III.

**ACCLES & POLLOCK, LIMITED.**

TELEGRAMS—  
ACCLES OLDBURY.

WELDLESS STEEL TUBES FOR AIRCRAFT CONSTRUCTION.

SEE ADVERT. INSIDE.

**TRIPLEX** Safety **GLASS**  
See Advt. inside.



. THE .  
**ENGINEERING TIMBER CO. Ltd.**

11, Victoria Street, London, S.W.

J. E. HUSON, Managing Director.

Telephone: Victoria—5073, 4210

Telegrams: Entikosil, Vic. London.

**SILVER SPRUCE**

**ASH**

**WEST VIRGINIAN SPRUCE**

**WALNUT**

**MAHOGANY**

**GLASGOW:**

**67, HOPE STREET.**

Telephone: Central 3273.

Telegraphic Address: Entikosil, Glasgow.

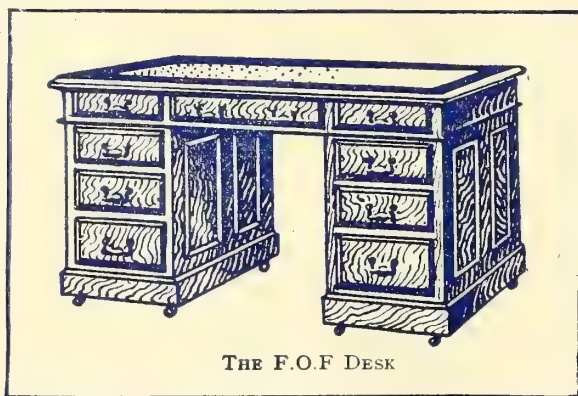
**PARIS AGENCY:**

**6, RUE DE HAVRE, PARIS.**

# Factory and Office Furniture

LARGEST STOCK FOR IMMEDIATE DELIVERY (NEW AND SECOND-HAND).

SPECIALITY



THE F.O.F. DESK

SAFES.

## COOKE'S (FINSBURY) LTD.

FINSBURY PAVEMENT HOUSE,  
 LONDON :: :: E.C. 2.

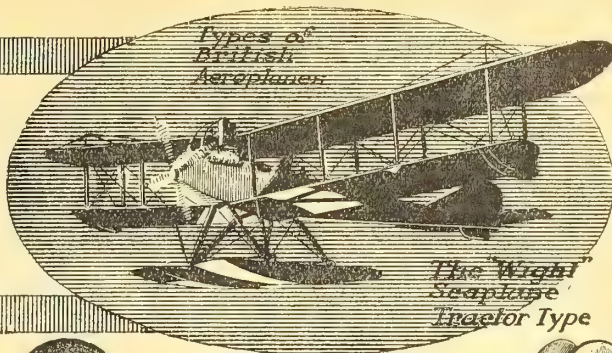
Telephones } LONDON } 6179  
 WALL } 573

See Telephone Book relating to our  
 Shopfitting, Signs and other Departments



# BROWN BROTHERS LTD

Great Eastern St London E  
MANCHESTER · PARIS · MELBOURNE



**Fork Ends.**  
1168/9 A/B.  
ex. stock.

**TURN BUTTONS.** All types stocked. Immediate supplies.

**FERRULES.—A.G.S. 156**  
10,000 gross in Stock.

**WASHERS.**  
A.G.S. 162 & 163.

**A.G.S. 156 Thimbles.**  
All sizes from immediate stock.

**BRIGHT STEEL WASHERS.** (A.G.S. 160 & 161 from stock).

Will sever up to 1/4 in. High Tensile Steel Wire or Bar. Immediate delivery.

**"DUCO" HIGH TENSILE WIRE CUTTERS.**  
30/- per pair.

**Duralumin Pulleys.**  
R.E. & F Sopwith (SL71) from stock.

**BINET STRAINERS.**  
10,000 3 by 30 Double Eye. INSTANT DELIVERY. Also other Types of Binet Strainers from stock.

**SPLIT AND TAPER PINS.**  
A.G.S. 166 & 167. Always in stock

Contractors to  
War Office, Admiralty, Air Ministry, Royal Aircraft Factory, Royal Naval Air Service, Royal Flying Corps, The Allied Governments, etc. A.I.D. Inspection on the premises.

**When you are requiring**  
Control Wheels, Levers and Wires, Turn Buckles, Shackle Pins, Eyebolts, Metric Bolts, Water and Petrol Hose Clips, Twill Canvas and Leather Upholstery, Hubs, Spokes and Nipples, Accumulators, Sparking Plugs, Gnome and Le Rhone Engine Copper and Asbestos Washers, Driving Chains, etc., etc., or anything in Metal Fittings, Aircraft Accessories and Equipment,  
**WRITE, WIRE OR 'PHONE US.**  
Telegrams—"Imbrowned, Bethroad." London.  
Telephones—6300 London Wall.

Metal  
Fittings  
a  
Speciality.

## The Aero Mechanical Co., Ltd.

CONTRACTORS TO THE AIR BOARD.

60-66, ROCHESTER ROW, LONDON, S.W.1.

Telephone :  
Vic. 7570 (3 lines).

Managing Directors :  
E. Salomon, J. Fogelson

Complete Fittings  
and Dies in Stock for  
latest D.H. Machines ;  
also most of the Fittings  
for other D.H. Machines  
and Handley-Page.

**Our reputation has been built up by our ability to effect deliveries right up to time.**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



GOVERNMENT  
CONTROLLED  
ESTABLISHMENT.



ADAM,  
GRIMALDI  
& CO., LTD.

UNDER THE  
MUNITIONS OF  
WAR ACT.

AIRCRAFT MANUFACTURERS  
- CONTRACTORS TO H.M. GOVERNMENT -



ALBERT WORKS, GLASSHOUSE STREET,  
ALBERT EMBANKMENT, VAUXHALL, S.E.11

Telegrams: "Autocoach, 'Phone, London."

Telephone: Hop 5552 (3 lines).

THE MIDLAND MOTOR CYLINDER CO. LTD.  
SMETHWICK  
TELEPHONE—289 SMETHWICK

N<sup>R</sup> BIRMINGHAM  
TELEGRAMS—RAFWORK, SMETHWICK

SPECIALISING IN

**AERO ENGINE CYLINDERS IN IRON AND  
ALUMINIUM TO PASS ALL GOVT. TESTS**

WE HAVE THE LARGEST OUTPUT OF AERO-ENGINE  
CYLINDER CASTINGS OF ANY BRITISH MAKER



STEEL HAND PUNCH

# STEEL

STENCIL  
PLATES



STEEL LETTERS & FIGURES

# STAMPS

BRANDING  
IRONS



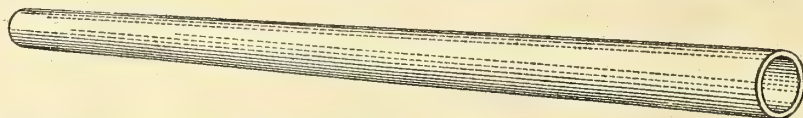
SET ROD STAMP

'PHONE: EAST 3331 (2 LINES).  
 CONTRACTORS TO HIS MAJESTY'S GOVERNMENT.  
**JOHN MEERLOO & SONS**  
 CLEVELAND WORKS, CLEVELAND STREET,  
 MILE END, LONDON, E.1.

TELEGRAMS: DAYHUR, PHONE, LONDON.



Patent No. 4704/15.



**McGRUER SPARS**  
are THE ACME of  
**STRENGTH and LIGHTNESS**

Particulars from:—

**McGRUER BENTWOOD HOLLOW SPAR Co.,**  
Commercial Wharf, Lambeth, LONDON, S.E.1.





## CASTINGS

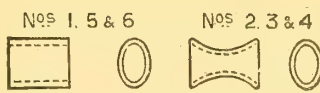
IT is when it comes to rejects after a number of operations in your machine shop that you know what is the real cost of the castings you use. If you use "Sterling" Castings the number of rejects and the sums paid for wages which are wasted thereon are reduced ————— to the lowest limits. —————

**Sterling Metals, Ltd.**  
 WIRE: "STERMET" COVENTRY  
 PHONE: COVENTRY 881  
**Coventry.**



SMALL FERRULE.  
PATTERN "A."

**WE CAN SUPPLY  
THESE AT ONCE**



SMALL FERRULES  
PATTERN "C"

IN VARIOUS GAUGES AND LENGTHS  
- SEND FOR FULL PARTICULARS -

# FERRULES FOR AIRCRAFT WORK

THE AEROPLANE STEEL TUBE AND PRESSWORK ARTIFICERS



SMALL FERRULE.  
PATTERN "B."



OLDBURY

BIRMINGHAM

Telegrams: "ACCOLES," OLDBURY Telephone: OLDBURY 111 (4 lines)  
A.B.C. CODE, 5th Ed.



SMALL FERRULE  
PATTERN "D"

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



A detailed illustration of a large biplane, likely a Whitehead model, flying over a landscape. The biplane has a large engine, a propeller, and two sets of wings. Below it, a smaller biplane is also flying. The background shows a hilly landscape with some buildings.

# WHITEHEAD

## AIRCRAFT

GEORGE WATSON  
1917

### RICHMOND SURREY



NON-POISONOUS  
DOPE

TITANINE



THE  
BRITISH AEROPLANE  
VARNISH CO., LTD.  
166, PICCADILLY, LONDON, W.1

Telephone . . . . . GERRARD 2312.  
Telegrams . . . . . TETRAFREE, PICCY, LONDON.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



**WOODSIDE ENGINEERING COMPANY, LTD.,  
POSSILPARK, GLASGOW.**

---

# **AEROPLANE TIERODS**

: IN :

**STREAMLINE AND ROUND SECTIONS**

**COMPLETE WITH**

**UNIVERSAL OR FORK JOINTS**

**LARGE STOCKS.**

---

**PROMPT DELIVERY.**

---

**Telephones.**

**WORKS: 1495 Douglas (2 lines.)**

**OFFICE: 3456 Central (3 lines.)**

(Private Branch Exchange.)

**Telegrams: "FUSELAGE," GLASGOW.**

**Registered Office**

**50 WELLINGTON STREET, 3  
GLASGOW.**



# **GNÔME & LE RHONE ENGINE COMPANY**

**Contractors to the  
War Office and Admiralty**

**London Offices :**

**27, BUCKINGHAM GATE, S.W.1., and THE HYDE, HENDON, N.W.9.**

**Works: Blackhorse Lane, Walthamstow.**



## **A. V. ROE & Co., Ltd.**

**Aeroplane  
Constructors.**

**NEWTON HEATH  
MANCHESTER.**

**Telephones—  
City 8530 and 8531.**

**Telegrams—Triplane.**



**HAMBLE,  
near SOUTHAMPTON.**

**Telephone—  
Hamble 18.**

**Telegrams—  
Roe, Hamble.**

**AEROPLANES**

**AND**

**PARTS.**



**166, PICCADILLY,  
LONDON, W.1.**

**Telephone—  
Gerrard 3186.**

**Telegrams—  
Senalpirt, Phone.**

**CODE: A.B.C.: 5th Edition.**



# The AEROPLANE

The Editorial and Advertising Offices of "The Aeroplane" are at 166, Piccadilly, London W.1.  
 Telegraphic Address: "Aileron. London." Telephone: Mayfair, 5407.  
 Accounts, and all correspondence relating thereto, should be sent to the Registered Offices of  
 The Aeroplane and General Publishing Co., Ltd., Rolls House, Breems Buildings, E.C.4.  
 Subscription Rates, post free: Home, 3 months, 8s. 10d. 6 months, 7s. 7d.; 12 months, 15s. 2d.  
 Foreign, 3 months, 9s. 0d.; 6 months, 10s. 0d.; 12 months, 20s. 0d. Canada, 1 Year, \$4.70c.  
 U.S.A., 1 Year, \$5.20c.

## ON THE R.A.F.

The following appeared in the "London Gazette" of March 15th:—

George the Fifth, by the Grace of God, of the United Kingdom of Great Britain and Ireland, and of the British Dominions beyond the Seas King, Defender of the Faith, To all whom these Presents shall come,

Greeting!

Whereas by the Air Force (Constitution) Act, 1917, it is enacted that it shall be lawful for Us to raise and maintain a Force, to be called the Air Force, consisting of such numbers of officers, warrant officers, non-commissioned officers and men, as may from time to time be provided by Parliament:

Now know ye that it is Our Will and Pleasure that the Air Force to be established pursuant to the said Act shall be styled the "Royal Air Force."

Given at the Court of Saint James', the 7th day of March, 1918, in the Eighth Year of Our Reign.

By His Majesty's Command,

*Rothermere.*

At any rate now we know the worst. The glory of the names of the Royal Naval Air Service and the Royal Flying Corps, with their traditions of gallantry, chivalry, and self-sacrifice, are to be merged into initials which stand for everything that has been bad in Military Aeronautics.

Probably the vast majority of the present personnel of the Flying Services have worn the King's uniform for so short a time that the initials R.A.F. connote to them merely an obsolete engine which does good work under strictly limited conditions, or those unpleasant streamlined wires which break of their own volition without enemy assistance, or perchance a curiously evil-smelling "dope" which causes sickness among air mechanics. These newcomers have no recollection of the evil days when the malfeasances of the Royal Aircraft Factory came near to wrecking the British Aircraft Industry and leaving the Flying Services without either aeroplanes or engines fit for war.

In those days the Royal Flying Corps, when General Henderson was Director-General of Military Aeronautics, staked its existence on the products of the R.A.F. The aeroplanes and engines of the despised "trade" were not wanted, and R.A.F. machines and engines were ordered to be built under contract. The R.A.F. machines, owing to complicated design and bad draughtsmanship, took months to build instead of weeks; the R.A.F. engines, owing to pure ignorance on the part of the designers, were utterly unreliable. And so at the end of 1915, when the R.F.C. should have had complete mastery in the air as it has to-day, the Germans had altogether the upper hand, except for a few gallant and fortunate fighting pilots who were in every single case mounted on machines of "trade" design.

### THE BREAKING OF A MONOPOLY.

The attempt to create a monopoly of design for the R.A.F. was broken by the R.N.A.S., which, under the guidance of Commodore Sueter, an officer with an open mind quick to grasp new ideas, deliberately took up everything which was turned down by the R.F.C. on the advice of its R.A.F. "experts." The R.N.A.S. assumed that because the R.A.F. disliked a thing and advised against it, therefore that thing must be better than the corresponding R.A.F. product. The assumption was that if the R.F.C. were allowed by the R.A.F. to adopt it, that thing would be dangerous to the prestige of the R.A.F. and that therefore it was turned down. Possibly the R.N.A.S. was wrong in its assumption, but the theory worked excellently in practice.

The R.N.A.S. ordered machines and engines in quantities which the R.F.C., on the advice of its "experts," refused to order at all. And then, when the R.F.C. found itself let down—as it was time after time—by the R.A.F. it used to come and beg for R.N.A.S. machines, and even for R.N.A.S. squadrons, to help it out of its trouble.

If anyone doubts the accuracy of these statements, let them inquire whether it was the R.N.A.S. or the R.F.C. which kept the Sopwith firm alive and encouraged the production of "1½ strutters," "Pups," and "Camels." Is it or is it not a fact that the R.F.C., being devoid of fighting machines owing to the utter failure of the first S.E.s. designed by the R.A.F., came and begged for Naval "Pups" and Nieuports and the earliest "Camels" to help them out of their trouble?

Also, did the R.F.C. do anything whatever to encourage the design or production of twin-engined bombers, such as the experimental Dyott and Fairey machines, and the ultimate great success, the historic Handley-Page? Not a thing. Yet thousands of pounds were wasted on R.A.F. experiments, and even on the "Canada" Curtiss in which an R.F.C. officer without any experience of aeroplane design was concerned.

It was just the same with engines. The R.N.A.S. encouraged experiments with engines while the R.F.C. gambled on the R.A.F. Three years after the outbreak of war, the R.A.F. air-cooled engine, which was begun about two years before war began, had become a reasonably reliable power-plant—and at least two years out of date as regards type, material used, and weight for horse-power. To-day the R.A.F. water-cooled engine, begun just about when war broke out, is a fairly decent engine which would have been useful a year ago and is now only fit to wash out when compared with modern engines. Meantime the R.N.A.S. secured the Rolls-Royce, Sunbeam, and other reliable engines.

Happily, the R.N.A.S. having shown the wisdom of backing independent designers, a few people of some



power in the R.F.C. managed to break away from the R.A.F. incubus, and to get hold of a certain number of independent machines and engines, which ultimately forced those in high places to recognise the advisability of allowing the best brains in the country to help the R.F.C. And it is thanks entirely to that break-away from the R.A.F. that the Flying Services hold their present dominating position.

#### THE LESSON OF COMPETITION.

The great lesson of all the past history of the Flying Services is that "competition is good for trade." One does not mean trade in the sense of profits for manufacturers, but for the trade the active service pilots have to do against the Hun. And it is for that reason that one chiefly dislikes the merging of the two Flying Services, and especially of the two technical departments, into one.

We have to-day the best possible men at the head of the Air Force, but the Air Council must, of necessity, rely entirely on its technical advisers for its choice of machines and engines and armament. Sir William Weir is, fortunately, entirely in favour of encouraging competition among designers so that they may produce the best possible machines, and one gathers that he is against the policy of standardising too much on one particular type. Which is entirely as it should be.

But when it comes to the choice of types to be standardised, either for a short or long period, that choice is in the hands of one department, or rather of a sub-department of a department. If that sub-department chooses badly, as it may easily do, then the whole output for the agreed period must be wrong. There can be no "opposite number" in a rival Service which can order other types and so save the situation, as was the case when the R.N.A.S. saved the R.F.C. in the past.

It is earnestly to be hoped that the Air Council will pay particularly close attention to this point. The selection for standardisation of the wrong machine, or the wrong engine, or the wrong gun-mounting for any particular period may easily turn the tide of aerial war against us at a most critical moment, and so may affect the whole course of the war on the ground. On the selection of the right types the whole future of the British Empire may easily depend.

The responsibility of those who advise technically those non-technical officials who makes the final choice is very grave. One has no doubt as to the honesty of intention of such technical advisers, but the fallibility of human nature gives one grounds for doubting whether any one department, freed entirely from competition with a rival department, can be trusted with such grave responsibility.

#### THE DANGER OF MONOPOLY.

The scheme for a great Government aeronautical dockyard, or a kind of aeronautical Woolwich Arsenal, which seems to have been the basis of the attempt to create an R.A.F. monopoly of design in the past, was undoubtedly quite sound in theory. Barring the fallibility of human nature, it would have been by far the most efficient and most economical way of producing war aeroplanes. But the Admiralty dockyards and Woolwich alike have proved conclusively that a Government monopoly is the very worst possible way of obtaining the best material for the Services and the best value for the nation's money.

It is therefore most necessary to guard against such monopolies. Whether the monopoly be that of a single department choosing or condemning machines and their component parts, or a single department controlling design, or the setting up of National Factories under commercial management but under the absolute control

of a Government department, the danger is equally great unless very great care be taken to guard against it.

The removal of the spur of competition is not merely dangerous because it may lead to laziness. One has too high an opinion of those now in control of production to think that anything like slackness would be permitted. The real danger lies in what one may perhaps best describe as a one-eyed outlook.

#### A PHYSICAL PARALLEL.

Those distinguished medical men who have of late been discussing the affairs of the Air Force Medical Service have laid great stress on the necessity for pilots having perfect eyesight. Perfect binocular vision is, one believes, the correct phrase. To obtain an absolutely correct estimate there must be two eyes, each regarding the object clearly from a slightly different angle. Two imperfect eyes may be better than one perfect eye, for, as one eminent optical surgeon has pointed out, if that one eye goes wrong while in action the result must be fatal.

Here is a precise parallel to the single department danger. The foresight and judgment of that department may be corrected by external means, as defective sight is corrected by glasses. Its vision may be put right by committees of selection, by trials and tests of various types, and by guidance from friendly hands outside. But if that vision is inherently wrong, or if it is temporarily obscured by some internal ailment, the result must be disaster, not merely to itself but to the many others dependent upon it.

#### DECENTRALISATION.

It is said that in these days the policy of all wise administrations is to decentralise, to give individual men of ability independent control, and to avoid the risk and complication and delay arising from depending on the control of remote organisations by a single individual, or a head office, or a central department. This doctrine of decentralisation amounts in effect to the re-introduction of the sound old principle of competition. One hopes most sincerely that the very able men who now constitute the Air Council will develop the system of decentralisation, or in other words the principle of competition, to the fullest possible extent in all branches of the Royal Air Force, but more particularly in that branch which has to deal with the design and choice of fighting material for our active service aviators.

The defective vision of the old R.A.F. in the past almost caused disaster to the R.F.C. Disaster was averted by the splendid *moral* of the Corps which General Trenchard had built up, and by the independent leadership of those officers who have since been promoted to command divisions, brigades, and groups of the R.F.C. Also, disaster was averted because the other eye of the Flying Services, the technical people of the R.N.A.S., saw differently from the R.A.F., and saw more correctly, if still imperfectly.

Now that the new R.A.F. is to be born—on April 1st, by all accounts—one hopes that it will not become a Cyclops. There is no need for it to develop as many eyes as a spider—or is it a fly which has such multiplicity of vision? Provided that it has good, long-sighted binocular vision it will suffice.

#### IN MEMORIAM.

Thus the R.A.F. badge may become honourable in history. The ratings of His Majesty's Navy wear on full-dress occasions a black silk neck-kerchief in memory of the death of Admiral Lord Nelson. Christians of the higher denominations wear a cross as the badge of their faith. So, and not otherwise, officers and men of the Royal Air Force may wear the letters R.A.F. in memory of those who have fallen because of the errors of the past, and in hope of the life to come.—C. G. G.



## THE PROMOTION OF SIR GODFREY PAINE.

The promotion of Commodore Paine to be a K.C.B. will be welcomed by the R.N.A.S. as a recognition of the good work done by the Navy's aviators under most difficult and frequently depressing circumstances. Despite the contempt of a certain class of Naval officer, the inability of sea-going senior officers to understand the importance of aircraft, and continual hampering and hindering at the Admiralty, the R.N.A.S. has won fame for itself as a fighting force. And for the fame which it has won no small share of the credit pertains to Sir Godfrey Paine. His new decoration may be regarded as, in a manner, a wreath of honour on the coffin of the R.N.A.S.

Captain Godfrey Paine, M.V.O., R.N., learned to fly on a 50-h.p. Gnome Short biplane in May, 1912, his certificate being No. 217, and was appointed shortly afterwards to be the first Commandant of the Central Flying School which was about to be formed at Upavon, on Salisbury Plain, as a joint Naval and Military school for the higher education of pilots of the Naval and Military Wings of the Royal Flying Corps, then, as it is again to be, an hermaphrodite force. The Naval people at the C.F.S. were generally known as "Basingstoke sailors," in recognition of the fact that the nearest thing to the C.F.S. which was of possible interest to the Navy was the Basingstoke Canal, which had been dry for a number of years.

Nevertheless Captain Paine adapted himself to the dry life on the top of the Plain, and from the foundation of the C.F.S. until some time after the outbreak of war he ran the school with marked success. He was fortunate in having appointed to him as Assistant-Commandant a certain Major Hugh Trenchard, of the Royal Scots, who is now somewhat better known as Major-General Sir Hugh Trenchard, K.C.B., Chief of the Air Staff. The system of the C.F.S. instituted by Captain Paine and Major Trenchard has stood the test of time, and officers who received their early training there have since proved the soundness of their education by laying down elaborate and successful organisations for the now greatly enlarged C.F.S., and for the various Naval training schools.

Why Captain Paine received the M.V.O. is not generally known among Service aviators, and not at all to the present writer, but one may rest assured that his excellent work in connection with aviation, and his subsequent appointment to be a C.B., and promotion to

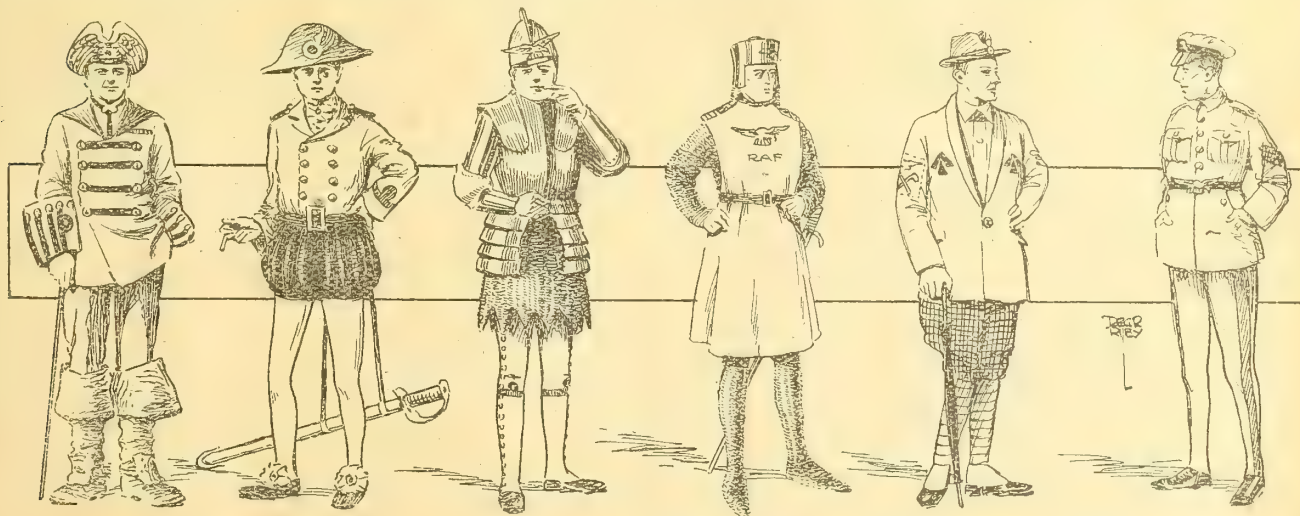
K.C.B., have completely deleted the mark of any little Naval indiscretion of the kind for which V.Os. in their various degrees are inflicted. And in any case, since the O.B.E. has been invented, the Victorian Order has become by contrast an object for veneration.

On leaving the C.F.S., where he had already been created a C.B. before the war, Captain Paine went to organise the big Naval shore-going school at Cranwell, and was promoted to Commodore. There he continued to do highly valuable work, and at the end of 1916, on the removal of Rear-Admiral Vaughan-Lee from the office at the Admiralty whence the R.N.A.S. was supposed to be controlled, Commodore Paine was appointed Director of Air Services. He also became a member of the Air Board and was created Fifth Sea Lord of the Admiralty. The whole tone and position of the R.N.A.S. has vastly improved since then.

His appointment as Master-General of Personnel on the Air Council is thoroughly sound, for he has been concerned entirely with personnel ever since flying began, except for the past twelve months. Commodore Paine does not profess to be a pilot, but he is an uncommonly sound judge of men and of their mental and flying abilities. There is no better proof of his judgment than the success of the appointments made by him to responsible positions in the R.N.A.S., whether to technical or administrative posts, or to active-service commands.

That distinguished writer, Mr. Henry Forester, has said that a "Master-General of Personnel should be rather good than clever." Probably Sir Godfrey Paine would promptly disclaim any charge of cleverness, but none can deny that he has always been a good man at his job. The fact that he is no longer one of their Lordships of the Admiralty is a distinct loss to that august if somewhat salt-encrusted council. A little of the mentality of the upper atmosphere was calculated to clear the air in their deliberations.

It is seldom that one finds receptivity to new ideas in any head of which the corresponding sleeves bear more than three gold stripes and an executive curl, and the fact that Sir Godfrey Paine has escaped the customary hardening of the mental muscles, despite his distinctively nautical aspect, makes it the more regrettable that the Navy should lose his valuable services. None the less, it is an ill wind which blows nobody any good, so one can say with conviction that the Admiralty's loss is the gain of the Royal Air Force.—C. G. G.



SOME SUGGESTED R.A.F. UNIFORMS: Left to right (1) "The Piratical," (2) "The Hearts of Oak," (3) "The Safety" (for Gun-layers only), (4) "The Knight of the Burning Piston" (for Low-Flying Specialists), (5) "The Semi-Civilian" (for those who object to discipline), (6) "The Tasty" (combining Navy, Cavalry and Infantry).



## A CASE OF INTEREST.

When Sir Henry Norman, a gentleman entirely unknown to those who fly and one who is not known to have taken any interest in aviation or to have done anything to assist the progress of aviation, was appointed by Mr. George recently to a seat on the Air Council, without any reason being given, or office assigned to him, some considerable surprise was caused.

Anything to do with Sir Henry Norman is therefore of very great interest to those who fly, and the mention of his name in connection with the latest *cause célèbre*, the Marconi-Telefunken affair, makes the case of intense interest to all concerned with Aeronautics.

The case opened last week, and amounted to a claim by the Marconi Company against the Government, because the Postmaster-General repudiated or proposed to repudiate an agreement for the erection of a chain of Empire wireless stations.

Sir Edward Carson, who led for the Marconi Company, alleged in his opening statement that the then Postmaster-General (Mr., afterwards Sir Charles, Hobhouse) and Sir Henry Norman were in Berlin in the summer of 1914—just before the war—negotiating with the Telefunken Co., the great German firm, to try and get them to come to this country and compete with the Marconi Co. in relation to these contracts.

Correspondence between Mr. J. A. Pease (now Lord Gainsford), who was later Postmaster-General, and Mr. Godfrey Isaacs, head of the Marconi Co., was read in court. The case is too long to report fully here, so one can only give brief extracts.

The following letter from the Directors of the Telefunken Company was read by Sir Edward Carson. It was dated "Berlin, July 21st, 1914," and was as follows:—

"As I told you upon the occasion of our meeting in Paris, when the Postmaster-General and Sir Henry Norman were in Berlin they made an offer to the Telefunken that they should start in keen competition in England with the Wireless Company, and that we could rely upon the Government's support provided that the Telefunken would make offers lower than the Wireless. Having regard to the arrangements which we have made, we told these gentlemen that we are naturally competing with the Wireless in England, and that it would be practically impossible for us to make lower offers than the Wireless Company, having regard to the fact that our expenses on account of licences would be higher than those of the Wireless Company, besides which our patent position in England was uncertain. From this Sir H. Norman formed the opinion that there would be little question of relying upon the Telefunken Company as a competitor of the Wireless in England, and he therefore approached Herr von Lepel with the object of encouraging him to form an English company and to obtain for him financial assistance with this object. Amongst others, we understand that these gentlemen are endeavouring to obtain financial support from Mr. Beit. We did not want to fail in giving you this information. P.S.—Mr. Hird knows more."

His Lordship asked who Mr. Hird was.

Sir Edward Carson understood that he was manager of Messrs. Siemens Brothers in London and agent for the Telefunken Company.

Sir Edward stated previously that Mr. Isaacs had an interview, in February, 1915, with Sir Charles Hobhouse at his request. Sir Charles admitted that he had been to the Telefunken Company, and he thought that it was a mistake on his part, having regard to his relations with the Marconi Company and this contract, to have done so.

Subsequently (on June 28th, 1916), Mr. J. A. Pease (now Lord Gainsford) wrote to Mr. Isaacs:—

"Since seeing you, I have had an opportunity of asking Sir C. Hobhouse and Sir Henry Norman whether there was any truth in the statements in the letter which you read to me from two directors of the Telefunken Company in Berlin. Sir C. Hobhouse informs me that he has never been accorded a sight of this letter, but he asserts that there is no foundation for the statements alleged to be contained in the letter, and that if such statements were made he would take proceedings to prove they were without foundation. Both Sir C. Hobhouse and Sir H. Norman absolutely deny that anything of the kind occurred, and are much incensed that there should exist any such libellous statements in any letter. As you told me the ground for refusing to carrying on the contract for the six stations in 1915 was

attributable to the letter referred to, I thought it only fair that you should realise that the statements contained in the letter are regarded by Sir C. Hobhouse and Sir H. Norman as a pure fabrication."

Mr. Isaacs replied to Mr. Pease on June 29th, 1916:—

"I am astonished to hear that Sir C. Hobhouse now alleges that there is no foundation of any kind for the statements contained in the letter of July 21st, 1914, from the two directors of the Telefunken Company in Berlin. I would point out that as long ago as November 6th, 1914, I gave to Mr. Murray at an interview on that date the contents of the letter at his request as one of the principal reasons why I mistrusted the Post Office. He informed me that he would report our interview to the Postmaster-General, who in turn would have to put the matter before the Cabinet. From that day to the receipt of your letter I have never received, notwithstanding its gravity, one word of repudiation of the contents of the letter, either by Sir C. Hobhouse or Sir H. Norman.

Early in 1915, Sir C. Hobhouse approached my brother (Sir Rufus Isaacs, now Viscount Reading) with a view to obtaining a private interview with me, and I met him first at his private house at his request, and then informed him of the contents of the letter. I shortly afterwards met him at the Royal Automobile Club. On both occasions he admitted that he had made the offer in question to the Telefunken Company, but said he did so because he thought competition would be a very good thing for the country, although he had since recognised as a Minister of the Crown that he should never have done so, and asked me what it was my intention to do. He pointed out that I had my foot on his neck, and if I intended to crush him it would mean his leaving the Government. That occasion was a painful one."

Mr. Pease wrote back: "I shall be obliged if you will send me copy of the letter signed by the two Telefunken directors to enable me to look further into the facts alleged." Mr. Isaacs replied enclosing a translation of the letter, and saying he would give a copy of the original in German if desired.

Mr. Pease wrote later: "Since I acknowledged copy of the letter addressed to you by the two directors of the Telefunken Company of July 21st, 1914, I have sent a copy to Sir C. Hobhouse and Sir H. Norman, and I think you ought to know that they both categorically in writing deny the statements contained in the letter. It is quite impossible for me to reconcile their statements with the allegations made by the Telefunken directors."

Mr. Isaacs then wrote to Mr. Pease: "I had already gathered from your previous letter that Sir C. Hobhouse and Sir H. Norman had assured you that the statements made by the Telefunken directors were false. It is, of course, impossible to reconcile the information which is now given you either with the contents of the Telefunken directors' letter or with the facts I have brought to your notice in my letter of June 29th (which referred to the interview with Sir C. Hobhouse). No doubt at the proper time this matter will be judicially investigated and the truth established."

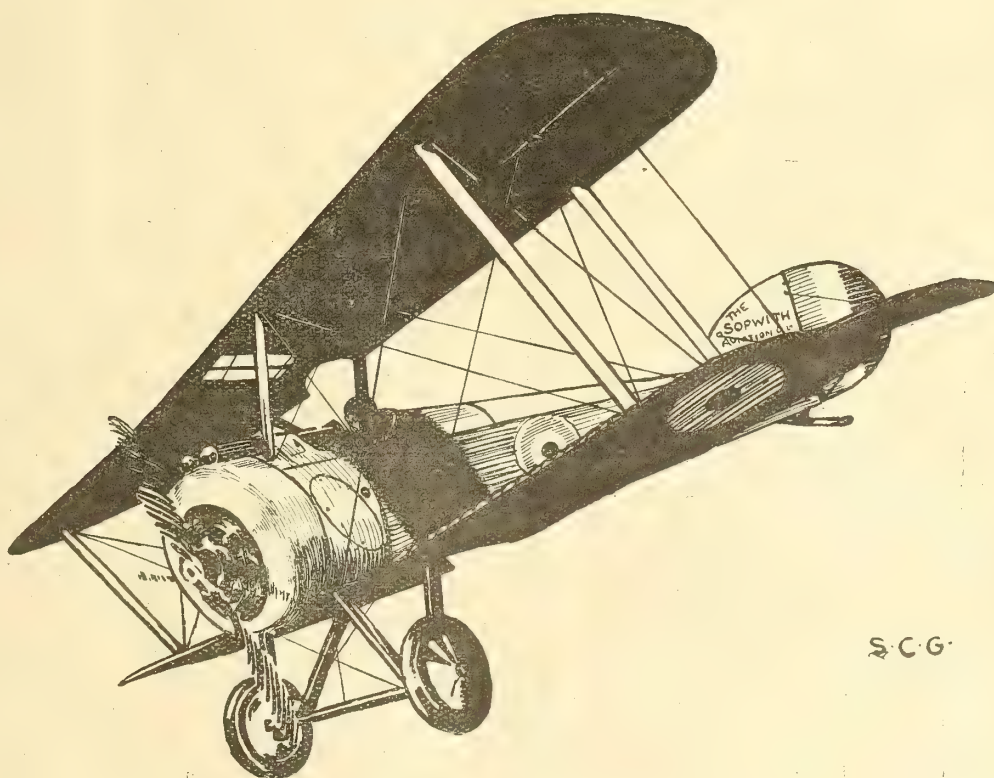
When the case came forward on March 18th, as the result of a consultation between Sir Edward Carson and Sir F. E. Smith (Attorney-General) Mr. Justice McCardie made a declaration that the Postmaster-General was not entitled to repudiate the agreement, and that the Company were entitled to compensation, which would be assessed by some competent authority. Sir Edward Carson applied for costs and liberty to apply, and, the Attorney-General not opposing, his Lordship made the order.

It is very regrettable that a Member of the Air Council should be subject to the allegation of having been concerned in an effort to import a German firm into this country in direct competition with a British firm. Owing to the case ending in this curious way by agreement, after Sir Edward Carson had made such a strong opening, one is denied all opportunity of knowing what Sir Henry Norman was really doing in Germany, and how he came to be mixed up in "wireless" affairs, seeing that pre-war wireless business seems to be more entangling than even barbed wire.

Rumour's busy tongue has it, once more, that Lord Rothermere is about to resign, as he finds the Air Force puzzle beyond his strength. It is now rumoured that Sir Henry Norman is to take his place as Air Minister. If there be any truth in that rumour, or if there be not, it would be well for Sir Henry Norman to make a clear statement in public, explaining his negotiations with the Telefunken Co. and his desire to bring that firm into competition with the Marconi Co.



# THE SOPWITH



**AVIATION COMPANY, LIMITED**  
**KINGSTON-ON-THAMES, ENGLAND.**  
**CONTRACTORS TO H.M. GOVERNMENT.**

Telephone: KINGSTON 1988 (8 lines).  
Telegrams: SOPWITH, KINGSTON:



Paris Office :  
21, RUE DU MONT THABOR.



## THE AIR FORCE MEDICAL SERVICE.

The following letters demand consideration:—

SIR,—May I be permitted to endorse C.G.G.'s remarks as to medical officers being permanently attached to flying stations and aerodromes.

One of the principal defects of military medical service during war time is that the exigencies of the service are all too often used as an excuse for removing a man from his job as soon as he is becoming interested and efficient.

Personally, there is nothing that I should like better than to be permanently attached, and have the opportunity of devoting my long general experience to the service of airmen, and acquiring special knowledge of new and interesting developments likely to arise. Unfortunately at this period there is a tendency to put off any permanencies until the war is over, and the rapidity with which changes are made prevent one from acquiring appliances and various expensive instruments for making observations.

The extent of the Air Service guarantees that many men with special knowledge will be required, and only those who are actively engaged in the work can possibly obtain the data required for acquiring it. These men must be left in their posts and all facilities given to them for investigations and recording the results. Time service should, if possible, be eliminated and men who exhibit interest alone retained in the Air Service.

The present staff of medical officers should be approached as to their experience and willingness or otherwise to remain in the Service for a period of years under a scheme of organisation, and for the first period of years age should be no drawback.

In the meantime facilities would develop for young men to train specially for Air Service, and within a few short years it would be found that the Air Medical Service would be second to none.

What is wanted is plain expression of plain facts and virile new methods in this virile new Service, and reformation and virility will appear in the older branches of the medical services.

This war has greatly advanced and modernised our methods and knowledge in medicine and surgery especially the latter. But what is still very much required is to get away from the old, obsolete time serving system which renders a medical officer into a "Ramcorps" to quote the writer of the article referred to.

No one deplores the fact that our system tends to turn out clerical officials rather than efficient physicians and surgeons more than the members of the R.A.M.C. themselves, as many have told me.

Any virile organisation which strikes out a new modern system devoid of or unhampered by bonds of red tape would be hailed with delight by the majority of the healing profession.

(Signed) CAPT. R.A.M.C. (Temporary).

SIR,—I am much interested in your leading article on the Air Force Medical Service, and in your comments on Sir Watson Cheyne's speech on the "Question of Vision."

I think the perfect vision Sir Watson speaks of is not perfect "acuity" of vision, but the proper co-ordination of the images received by the two eyes in the brain (fusion centre), or on their passage there; that is, not whether a pilot is short-sighted, or astigmatic, but whether he has, or has not, the power of invariably fusing the two images under all and every condition of stress.

As an ophthalmic surgeon of nearly 20 years' experience, I can say this perfect fusion is lacking in about one-third of the patients who have been examined by me during those years. The older a patient the better the fusion power is. In quite young children defective fusion is found in the form of squint, in mild cases the squint is only noticeable when the child is tired, or nervous or ill; in those somewhat older, who do not squint, but cannot fuse without involuntarily keeping up some automatic will power, it is quite conceivable, as a result of tension during flying being suddenly removed, the two images are not fused temporarily, one eye only is used, and the sense of distance is lost, hence the reason why some men are found constantly to crash on landing, and may account for some collisions.

By the way, as you are doubtless aware, we are given two eyes, that we may be able to judge distance, perspective, etc., so, if a man loses one eye, it takes him some time to learn how to pick up a tumbler, or to put one down near the edge of a table without dropping it on the floor, or put a cup in a saucer, etc., or pour a fluid from one vessel into another.

With regard to the one-eyed civilian pilot mentioned by you, he has probably learned how to judge distance, perspective, etc., and in some ways is safer than a pilot with defective fusion; notwithstanding, I should absolutely refuse to go up with him, for if, whilst in the air, anything should happen to his one eye (for instance an intraocular hæmorrhage, caused by a sudden diminution of blood pressure in a rapid descent), it would be all up with pilot, passenger, and machine.

Incidentally, many men talk of having a "master" eye, in these cases, on careful examination, it is often found there is a latent squint which causes no trouble under ordinary conditions of life.

With regard to "acuity" of vision, I consider a slightly short-sighted man (say a myope of 1 D. or 1.5 D.) would make a safer pilot than a long-sighted man with the same amount of hypermetropic error; but your space, and time, precluded my going into this question. (Signed) "SURGEON."

## THE ROYAL AERO CLUB.

The annual general meeting of the members of the Royal Aero Club of the United Kingdom will be held on Wednesday, March 27th, 1918, at 3, Cifford Street, New Bond Street, London, W.1., at 6 o'clock.

The following members have been nominated for the nine vacancies on the committee:—

*Brig.-Gen. the Duke of Atholl,*Henry Knox.	
M.V.O., D.S.O.	Col. F. Lindsay Lloyd.
*Maj.-Gen. W. S. Brancker,*Maj. J. T. C. Moore-Brabazon,	
D.S.O., R.F.A.	R.F.C.
*Ernest C. Bucknall.	*Wing Comdr. C. R. Samson,
*R. O. Cary.	R.N., D.S.O.
*G. B. Cockburn.	A. Mortimer Singer.
C. G. Greenhill.	*T. O. M. Sopwith.
Lt.-Col. W. D. Beatty does not seek re-election.	

Ballot-papers have to be received back by 12 noon on Tuesday, March 26th, 1918.

[The names marked \* are those for which most members seem inclined to vote.—Ed.]

## THE RAIDER'S SEAPLANE.

A message from Copenhagen, dated Feb. 28th, says that prisoners from the "Wolf's" consort, the "Igotz Mendi" (stranded at the Skaw, the most northerly point of Denmark), have arrived at Copenhagen, and described the work of the "Wolf" during the past months.

In June, they say, the Australian steamer "Wairuna" was detected by the seaplane belonging to the "Wolf," and was soon after captured by the vessel outside Saone Island, north of Kermadec Islands.

The "Wolf" then turned south of Australia, and from there west of the Fiji Islands and north of Santa Cruz to the Kermadec Islands. Proceeding north, between Bismarck Islands and New Guinea, on July 16th, the United States schooner "Encore," loaded with benzine, was sunk. From the benzine the seaplane replenished her store.

Southwards by the Celebes, towards Singapore, the raider sailed towards Java, then to Ceylon, spreading mines in her track, particularly near Colombo. Here the seaplane reported a large passenger steamer. This was the Japanese "Hitachi Maru," 6,557 tons. She was stopped by a bomb from the seaplane and shots from the "Wolf."

The "Wolf" then went west of the Azore Islands to the north-west of Iceland, but was compelled to return owing to huge masses of ice. She then made for the coast of Norway, and thence to the west coast of Jutland.

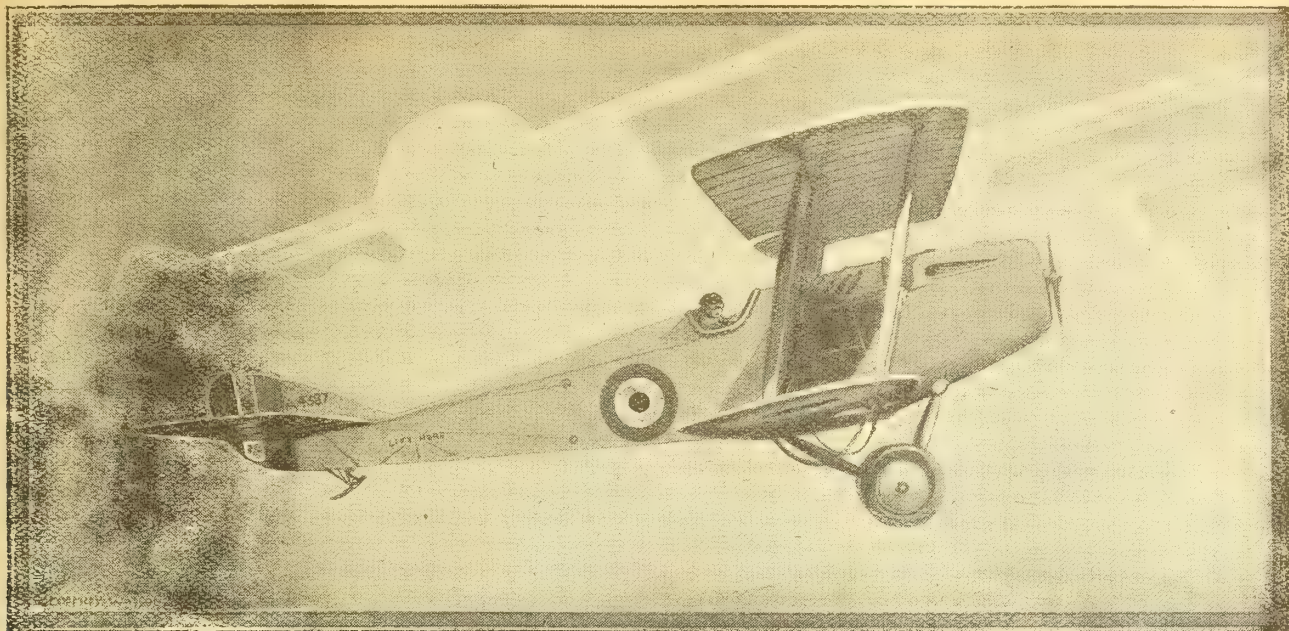
Two Australian officers—Colonel Strangeman and Maj. Flood, of the Australian Army Medical Corps—who were captured by the German raider, the "Wolf," have arrived in this country. Among other things, they say that the crew of the "Wolf" were particularly proud of the achievements of their seaplane, and claimed, among other things, that she had made an early morning excursion at a great height over Sydney Harbour, and had noted the disposition of the ships there. It was, too, they said, owing to the seaplane sighting an Australian warship that they were able to escape capture while minelaying at Gabo Island.

After idling about in the Indian Ocean for some weeks, the "Wolf," on Sept. 26th, met its next victim, the "Hitachi Maru," a Japanese vessel, with passengers and cargo, about 540 miles from Colombo. For 24 hours previously the Germans had been bragging of the big prize they were about to take, for the seaplane had been able to confirm what the "Hitachi Maru's" intercepted wireless messages had indicated. Her capture was an exciting affair.

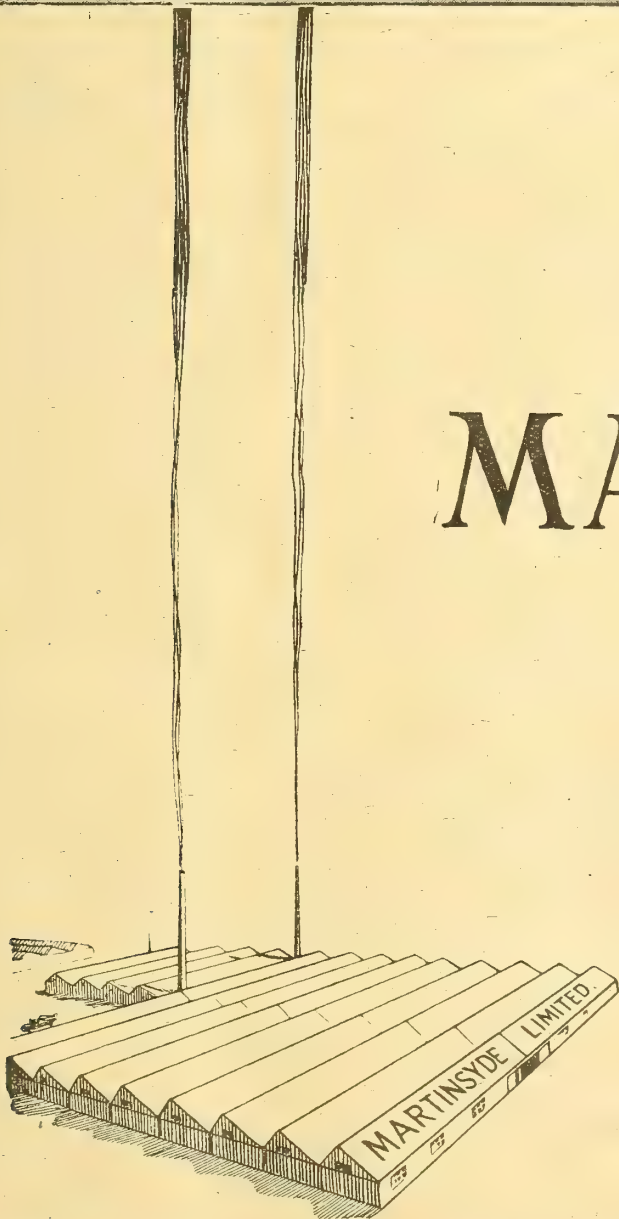
"The Bird was hovering overhead with bombs ready when the "Wolf" fired twice across the "Hitachi Maru's" bows. The "Hitachi Maru" did not immediately stop, and, as an excuse no doubt for their subsequent conduct, the Germans declared that they saw and even had photographs of the "Hitachi Maru's" gun crew preparing the gun for action.

[The use of the seaplane by the raider confirms the possibilities of such craft for ocean-going work set forth in this paper long before the war. One merely asks how it is that, despite the limitations of the German Navy, the German Admiralty seems to have realised the possibilities of seaplanes for certain odd jobs so much better than our own Admiralty has done. Two or three fast cruisers with four or five seaplanes apiece could have caught the "Wolf" if their operations had been systematically organised and intelligently carried out.—Ed.]





# MARTINSYDE



Aerodrome . and  
Auxiliary Works:  
BROOKLANDS.

Head Office  
& Works:  
WOKING, Surrey.





# THE AIR COUNCIL AND ITS FUNCTIONS.

(Continued.)

BY HENRY FORESTER.

## THE CONTROLLER-GENERAL OF EQUIPMENT.

The Controller-General of Equipment, according to Major Baird, "combines the functions of the Master-General of the Ordnance and the Quartermaster-General on the Army Council." His work, while not so decorative as that of other members of the Air Council, is of the highest importance in the maintenance of the Air Force. None of the brilliancy of War is for him. He can lead no troops in action, nor is he privileged at any time to take part in the dramatic episodes which one understands are interpolated into war for the benefit of history. He provides the stage properties from a place of mystery hidden from the public eye. Without him the Air Force would starve or would go unclad, robbed of dignity in the moment of success.

It has been explained in an earlier article that the Chief of the Air Staff is responsible for the preparation of schemes in regard to the design of aircraft and other munitions of aerial war. It is the duty of the Controller-General of Equipment to undertake the provision of such aircraft in accordance with the wishes of the Chief of the Air Staff. He is responsible for the supply being adequate and for the effective construction of the machines supplied. He maintains the reserve of aircraft from which all replacements are drawn.

## THE UNIVERSAL PROVIDER.

The manufacture and supply of armament is also in his hands. In exactly the same manner as the Master-General of Ordnance he must make certain not only that the Air Force is well supplied with ammunition and with guns, but that there is an adequate reserve to replace the casualties of war. Though the Chief of the Air Staff must keep in touch with all improvements in armament in foreign armies, and must suggest methods of advancing the arms in use at home, that does not absolve the Controller-General from experimenting with new designs and bringing forward successful patterns for approval. There is a vast field of work in this direction for the new Controller-General. It is probable that developments in this direction will be of greater import in the immediate future than in any other branch of the activities of the Air Force.

Aircraft engines, the motive power of aircraft, the lack of which retarded the science of aeronautics for centuries, must be provided by this department. He is informed as to the number of types to be maintained, and he is expected to emulate the methods of a universal provider in his habits. The engines required must be available at the desired time with a supply of spare parts sufficient, but not much more than sufficient, to keep these engines in running order under all normal conditions. He does not deal direct with the manufacturers so long as the Director-General of Aircraft Production still remains in existence, but he must arrange with that official to supply whatsoever may be necessary.

## WORKS AND BUILDINGS.

If the parallel with the Master-General of the Ordnance holds good to any further degree, the Controller-General of Equipment will be responsible for the construction of aircraft sheds and stores on aerodromes, barracks for personnel, and such fortifications as may be necessary at Air Force stations. Though this work can be dealt with in a few lines of print, it is of high importance, and, as those who have even a little experience know well, it is of great extent. Ranges for aircraft guns (not anti-aircraft) and for small-arm training of personnel must also be constructed by his department.

His department must lay the drainage without which no aerodrome can continue its happy existence. At night the barracks and aerodromes must be lit, and it is the Controller-General of Equipment who must see that electric light or other means of illumination is laid on.

## THE R.A.F.

It is not clearly laid down, but if one can rely on the implied parallel all experimental establishments should be in his care. The Royal Aircraft Factory will in this case enter another phase in its weary existence, and will cease to be an isolated centre of trouble criticised by most and admired by few. If its position in the aeronautical world be made definite and unambiguous, the valuable work it has done in the past and the more valuable work it will do in the future will be appreciated with greater understanding by all those who are acquainted with aeronautics. There is a place for it in so far as the development of aeroplanes is concerned.

Experiments which would be either beyond the means of private constructors or not of immediate commercial value might be carried out by the Factory. Aeroplanes possessing doubtful habits, yet of value for use in war, could undergo trials by R.A.F. pilots in the hope of eliminating all that is disagreeable in their behaviour.

[One is left in doubt as to whether the author refers to the pilots or to the machines.—Ed.]

Provided no power of selection is given to the establishment, its position as a centre of advice and of experience would make it respected and appreciated in the Service and in the industry. Keeping it apart from executive power would prevent much of the criticism sometimes fair, but more often unfair, that has harassed it during the past.

The Air Force will require its Engineer Corps to undertake those duties which in the Army are undertaken by the Royal Engineers. The equipment of this branch and the maintenance of its stores will also lie in the hands of the Controller-General of Equipment.

## A POSSIBLE ALTERATION.

The duties of this member of the Air Council may extend in the days following the war if, as is possible, the Directorate of Aircraft Production ceases to exist. As in the case of the Master-General of the Ordnance, the greater part of the work of the Equipment Department in normal times is now being carried out by the Ministry of Munitions, and it is yet to be proved that any very great advantage has followed from the adoption of the new system.

There is no reason why a new department should do better work than a part of an existing department can do if the latter is adequately staffed. The craze for the formation of new departments is a method adopted during the present war in order to stifle public criticism.

Each age has its political methods. Nero abolished his critics by means of the arena and a number of underfed lions, thus combining public amusement with public efficiency. The present era has gentler ways of dealing with those who think any government in existence is worse than any government yet to be formed.

They are not so effective, while their expense is considerably high. A new Ministry is formed, and criticism is burked because each new thing in life must be given its chance to prove its right to a place in the sun.

## TRANSPORT.

In that part of his work which corresponds to that of the Quartermaster-General in the Army he has to do



THE BRITISH & COLONIAL  
AEROPLANE CO., LIMITED

— FILTO \, BRISTOL —

CONSTRUCTORS OF

*The "Bristol" Aeroplanes.*

— CONTRACTORS TO —  
H.M. AIR FORCES.

Telegrams:  
"AVIATION, BRISTOL."



Telephones:  
3906 BRISTOL  
(Private Branch Exchange)



with all that concerns the existence and comfort of the personnel of the Air Force, in addition to other matters of almost equal importance.

In peace and in war transport is a matter of first importance. The equivalent to the Army Service Corps which will be formed for the Air Force will, it is presumed, be under the direction of the Controller-General of Equipment. Presumably it will consist entirely of mechanical transport, as the horse is too effete an animal to form a part of the establishment of the newest of all Services. But the absence of the horse will simplify things but little. There are places where no motor can get unless the landscape be altered purposely, but there are few points which are unreachable by the humble horse.

Transport ranges from the cars that the newspapers imagine call each morning for Staff officers at their suburban homes to conduct them to their work and then waiting idle until lunch-time again brings them into use, to the heavy lorries for the conveyance of stores. *En parenthèse* there is yet to be designed a motor transport wagon which can rival in universal utility the G.S. wagon used in the Army. Its uses vary from the conveyance of stores over roads to the duties of a temporary ferry-boat over the rivers that are still permitted to embarrass modern warfare. It is inexpensive and is almost unbreakable. When the almost impossible has been achieved, the G.S. wagon makes an excellent ending as firewood.

### AIRCRAFT IN THE HOUSE.

On March 18th **Sir A. Mond**, First Commissioner of Works (Swansea Town, L.), replying to a question by **Mr. Kennedy Jones** (Middlesex, Hornsey, U.) alleging that much confusion and dislocation of work, with resulting inefficiency, was being occasioned at the Air Ministry by reason of failure to readjust the accommodation necessary for the Department, said:—I am fully aware of the paramount importance of the Air Ministry and have given extreme personal care and attention to its need in the matter of accommodation when its final requirements were made known to me. I cannot in any way admit that any delay whatsoever has occurred so far as the accommodation question concerns my Department, nor have any promises been made which have not been carried out. Apparently the hon. member does not realise the magnitude of the operations which this question has involved. I may mention that, apart from the Kingsway premises which have had to be taken over, which involve the acquisition of premises occupied by about 160 business firms and the rehousing of three large Government Departments, I have acquired for the Air Ministry during the past few months the Covent Garden Hotel, the Metropolitan Water Board Offices, a large block of offices in Clement's Inn, the Savoy Mensons, 50 rooms in the Strand Palace Hotel, 20 bedrooms in the Constitutional Club, and a large temporary structure on the roof of the Hotel Cecil.

**Mr. P. A. Harris** (Harborough, L.).—Is not the real cause the want of organisation in the Department? Would it not be better to reorganise the Department? **Sir A. Mond**: I am not responsible for the organisation.

**Mr. Hogge** (Edinburgh, E., L.).—In view of the urgency of the Air Minister's work of winning the war, ought we not, apart from inconvenience to anybody, to get right down to getting efficient administration? **Sir A. Mond**: That is in no way the concern of my Department.

**Mr. Kennedy Jones**: Can the right hon. gentleman assure us that there is no truth in the statement that there has been delay in this matter, due to the belief that he hopes to renew his spring offensive against the British Museum? **Sir A. Mond**: If any delay has taken place, the hon. member has not assisted by preventing the Air Board going to the British Museum.

### THE CHRISTIAN YOUNG R.F.C.

A Y.M.C.A. hut for the R.F.C. was opened by Lady Gwen-doline Colvin at High Beech on March 18th. Maj.-Gen. E. B. Ashmore occupied the chair. **Sir Arthur Yapp**, addressing a large gathering, said it was the intention of the Y.M.C.A. not to disband the huts, of which there were now some 5,000 on all the fronts, at the conclusion of the war, but to set them up in all parts of the country as recreation halls. In the after-war reconstruction there would be a need for such places, as experience had shown that when the Army was demolished the men would desire to have many of the advantages belonging to these huts which had come to be appreciated so much.

### MOBILISATION MOVEMENTS.

Not only has road transport to be organised, but the actual movements in mobilisation are arranged by the Equipment Department, both by road and rail, in accordance with the general scheme drawn up by the Chief of the Air Staff and the Master-General of Personnel.

All sea transport in vessels chartered by or belonging to the Air Force is supervised by this omniscient officer, who must combine the knowledge of Noah as to the disposal of heterogeneous cargoes with the attention to detail and suavity of manner of a respectable undertaker.

But for the careful organisation of the Controller-General of Equipment the Air Force would be unfed and unhoused. Even the coals are provided by, or rather the arrangements for coals are dependent on, his efforts. A little thought will enable any to realise the intricacy and difficulty of this branch of the Service.

While in parallel with the Master-General of the Ordnance, the C.G.E. arranges for the building of barracks, his equivalent duty to the Q.M.G. is in the occupying and furnishing of these quarters. All buildings that are hired or commandeered are taken over by him.

He has in his charge the Ordnance Stores of the Air Force, though this branch could possibly be renamed. From these all stores, from soap to button-sticks, are issued to the troops. Clothing and equipment both come from him.

### MOUNTAIN FLYING.

**Dr. A. M. Kellas**, the well-known scientific mountaineer, lectured on March 18th before the members of the Royal Geographical Society, under the presidency of **Dr. Hugh Mill**, at the Society's House, Kensington Gore, on "The Possibility of Aerial Reconnaissance in the Himalaya." The range, he said, had only six peaks above 27,000 feet high, and an aviator flying at about 23,000 or 24,000 feet should have no difficulty in crossing if the highest peaks were avoided, while, if he chose certain of the gorges, an altitude of some 19,000 feet would suffice. The greatest of the many obstacles to be encountered was the mountain sickness which occurred in the highest altitudes through deficiency of oxygen. The gradual climber, going afoot, was less handicapped in this respect than the aviator rising suddenly from sea level in his machine; on the other hand, the pedestrian had more fatigue to undergo, and this practically equalised matters. The chief desideratum, in any case, was an adequate supply of oxygen, with a proper inhaler.

**Rear-Admiral Mark Kerr**, **Mr. Douglas W. Freshfield**, **Colonel Sir Thomas Holdich**, **Capt. Swinton**, and others took part in the discussion, the speaker first named expressing his opinion that successful reconnaissance flying over the Himalaya range would not be possible for the next 100 years. Very large machines would be needed, and correspondingly big aerodromes. The soft, snow-covered surfaces would also be a serious handicap.

[**Admiral Kerr** seems to be unduly pessimistic. Aeroplanes are certainly unsuitable for such work at present, but much may be done in the next ten years. Also there are possibilities for airships in such work.—Ed.]

### THE FOOD OF THE BIRD-MAN.

**Commr. Harold E. Perrin**, secretary of the Royal Aero Club, Clifford Street, summoned at Marlborough Street Police Court last week in respect of the consumption at the club of meat, sugar, and flour in excess of the quantities allowed by the Public Meals Order, and for failing to keep a register of meals and food used, was fined £2 and £1 costs on each of nine summonses.

The defence was that the club had suffered from a series of petty thefts of food by certain servants, and that it had been impossible to keep a register in the prescribed form owing to the depletion of the staff.

[It does not appear that our popular bird-men have bird-like appetites, unless one compares them with non-flying birds, such as the ostrich or emu.—Ed.]

### WHAT THE CANADIAN SAID.

There are so many Canadians and Australians in the Air Force that one makes no apology for retailing the following yarn. When the Australians captured Bethlehem of Judæa their gallant action was duly announced to a battalion of Canadians "somewhere in France." And a quiet voice from the rear rank remarked, "And you betcher sweet life that the shepherds watched their flocks that night."



# MANNEGERTON & Co.Ltd.

CONTRACTORS TO THE ADMIRALTY  
AND H.M. WAR OFFICE.

Designers and  
Manufacturers of Proved  
Efficiency of all Types of  
**AIRCRAFT**

HEAD OFFICE AND WORKS

**AIRCRAFT WORKS, NORWICH**

---

SPECIAL DEPARTMENT

for the manufacture of

**AIRCRAFT ACCESSORIES**

(Strainers, Bolts and Nuts, etc., etc.)

177, CLEVELAND ST., LONDON, W.1.

# MANNEGERTON & Co.Ltd.

LONDON

NORWICH

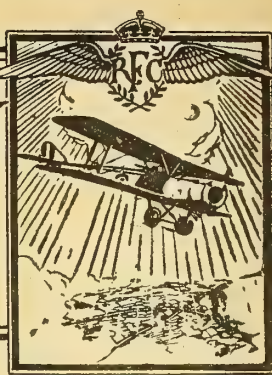
IPSWICH

BURY ST. EDMUNDS.





# NAVAL *and* MILITARY • AERONAUTICS •



## FROM THE "LONDON GAZETTE."

ADMIRALTY, March 7th.

His Majesty has been pleased to approve of the appointment of Commodore Godfrey Paine, C.B., M.V.O., to be a Knight Commander of the Order of the Bath.

Temp. Flt. Lts. to be temp. Flt. Comdrs.—C. P. O. Bartlett, D.S.C., L. W. Omerod, D.S.C. (March 1).

WAR OFFICE, March 7th.

With reference to the awards conferred as announced in the "London Gazette" dated October 18th, 1917, the following are the statements of service for which the decorations were conferred:—

### THE MILITARY CROSS.

Temp. Lt. O. B. W. WILLS, R.F.C.

He carried out a reconnaissance on a hostile heavy howitzer emplacement nearly 8,000ft. over the line. He descended to a height of 2,000ft., and carefully examined the position. Having decided the exact position of the gun, he successfully directed the artillery on to it, securing a direct hit on the emplacement.

Sec. Lt. F. WOODCOCK, R.G.A., Spec. Res., and R.F.C., Spec. Res.

He performed continuous and valuable work in contact patrols and reconnaissances, flying at a low altitude. On one occasion in a very strong gale, flying low, he obtained information of the greatest importance.

WAR OFFICE, March 12th.

REGULAR FORCES—ESTABLISHMENTS—R.F.C.—MIL. WING.—Sqn. Comdrs.—Sec. Lt. (temp. Capt.) A. D. Bell-Irving, M.C., Gord. Hghrs., Spec. Res., from a Flt. Comdr., and to be temp. Maj. while so empld. (Jan. 31); Sec. Lt. (temp. Maj.) J. C. Callaghan, M.C., R. Muns. Fus., from Comdt. (graded as Sqn. Comdr.), School of Aerial Fighting, and to retain his temp. rank while so empld. (February 1st).

Flt. Comdrs.—From Flying Officers.—Lt. G. Cory-Wright, E. Kent R., Spec. Res., and to be temp. Capt. while so empld. (February 5th); Temp. Capt. K. R. Paterson, Gen. List (February 6th). And to be temp. Capt. while so empld.:—Lt. D. L. P. S. Stuart-Shepherd, E. Lancs. R. (February 7th); Temp. Lt. H. J. Scales, M.C., Gen. List (February 12th); Sec. Lt. R. C. Steele, D.S.O., Spec. Res. (February 13th).

Asst. Instrs. in Gunnery.—Graded as Equipment Officers, 2nd Cl.—From Asst. Instrs. in Gunnery (graded as Equipment Officers, 3rd Cl.):—Temp. Lieut. H. Bristow, Gen. List (January 1st); Lt. J. H. Turner, D. Gds., Lt. A. V. Shewell Glouc. R., Temp. Lt. M. H. MacLucas, Gen. List, Lt. J. A. P. Martin, Yeo., T.F. (February 1st); Lt. E. V. Maclean, R.F.A., T.F., Temp. Sec. Lt. F. G. Brockman, Gen. List, and to be temp. Lt. whilst so empld. (February 22nd).

Experimental Officers, 2nd Cl.—(Graded as Equipment Officers 2nd Cl.)—From Equipment Officers, 3rd Cl., and to be temp. Lts. whilst so empld.:—Sec. Lt. R. G. Watts, Spec. Res. (December 4th, 1917); Sec. Lt. W. E. Bousfield, Spec. Res. (February 16th).

SCHOOLS OF INSTN.—SCHOOLS OF MIL. AERONAUTICS.—Comdt.—(Graded as a Wing Comdr.)—Temp. Capt. (actg. Lt.-Col.) G. C. de Dombasle, Nova Scotia R., a Sqn. Comdr., and to retain his actg. rank whilst so empld., vice Maj. (temp. Lt.-Col.) I. M. Bonham Carter, Northd. Fus. (September 10th, 1917). (Substituted for the notification in the "Gazette" of November 12th, 1917).

MEMORANDUM.—To be temp. Maj.:—Temp. Capt. (Qrmr. and Hon. Capt., R.F.C.) T. Lyons, M.B.E., while empld as a Dep. Asst. Dir. at the War Office (February 25th).

\* \* \*

The following are among those mentioned for distinguished and gallant service in a dispatch which the Secretary of State for War has received addressed to the Chief of the General Staff, India, by Lieut.-General Sir Stanley Maude, K.C.B., Commanding-in-Chief Mesopotamian Expeditionary Force:—

### STAFF AND HEADQUARTERS.

Gordon, Lt.-Col. R.F.C., C.I.E., Ind. Army.

### ROYAL FLYING CORPS.

Bayly, Lt. (temp. Capt.) L. J., R.A.; Buxton, Lt. (temp. Capt.) V. (Capt., Leic. R.); de Havilland, Capt. (temp. Maj.) H., D.S.O., Spec. Res.; Hunting, Lt. (temp. Capt.) P. L. Northd. Fus. (T.F.); Lilley, Temp. Capt. L. M.; Morris, Temp. Lt. R. K., Gen. List; O'Neill, Capt. W. H. L., Sikhs, Ind. Army; Page, Sec. Lt. L. S. M., E. Kent Yeo.; Skinner, Lt. A. E. L., Norf. Yeo.; Tennant, Bt. Maj. (temp. Lt.-Col.) J. E., M.C., S. Gds.; Young, Temp. Sec. Lt. A. E.

Cagliari, No. 36678 2nd Class Air Mech. J.; Curtis, No. 3834 Sgt. F. W.; Kiel, No. 5551 1st Cl. Air Mech. F.; Smith, No. 35507 Cpl. F. E.

\* \* \*

WAR OFFICE, March 13th.

REGULAR FORCES—ESTABLISHMENTS—R.F.C.—MIL. WING.—Adjut.—Lt. A. G. Smith, M.C., Lrs., and to be temp. Capt. (without the pay or allowances of that rank) whilst so empld., Nov. 1st, 1917.

\* \* \*

The King has been pleased to approve of the award of the Military Medal for bravery in the Field to the following Non-commissioned Officers and Men:—

49424 2nd Cl. Air Mech. H. H. Edmunds, R.F.C. (Port Talbot). 87595 1st Cl. Air Mech. H. Else, R.F.C. (Mansfield). 40277 1st Cl. Air Mech. W. Hargreaves, R.F.C. (Love Clough); 22629 2nd Cl. Air Mech. G. O. Leeding, R.F.C. (Rushden); 17116 1st Cl. Air Mech. T. Leyland, R.F.C. (Blackburn); 23611 1st Cl. Air Mech. F. C. Smyth, R.F.C. (Sutton).

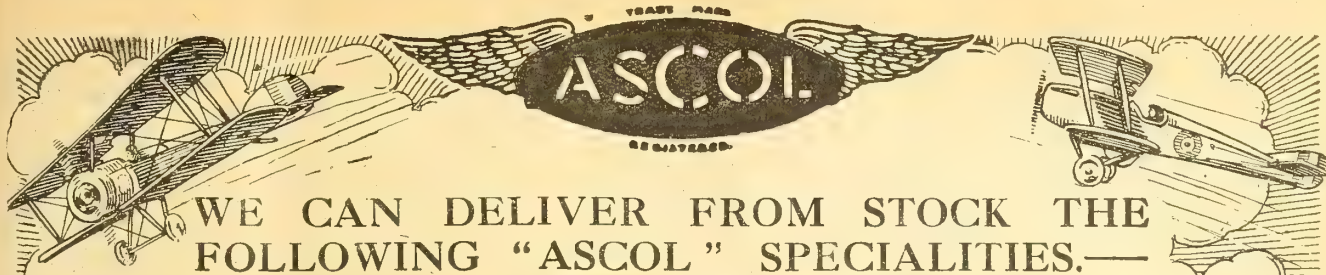
\* \* \*

The names of the following have been brought to the notice of the Secretary of State for War for valuable services rendered in connection with the war, and when applicable an entry will be made in the records of service of officers and other ranks:—

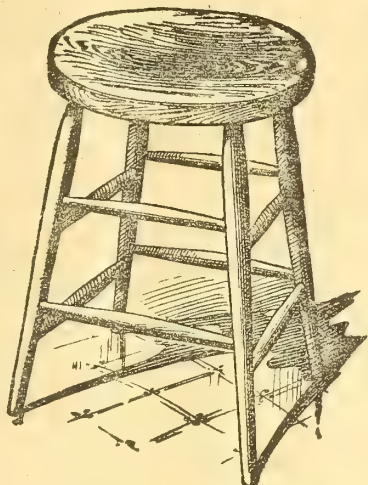
Adeley Capt. (temp. Maj.) G. G., R. Ir. Rif. and R.F.C.; Aizlewood, Capt. L. P., M.C., Yorks. and Lanc. R., T.F. and R.F.C.; Allen, Temp. Lt. W. R. P., Gen. List and R.F.C.; Alston, Temp. Lt. C. H. T., Gen. List and R.F.C.; Anderson, Capt. A. J. G., Lond. R. and R.F.C.; Anns, Lt. (temp. Capt.) H. F., Lond. R. and R.F.C.; Atkinson, Temp. Lt. J. A., Gen. List and R.F.C.; Auker, Sec. Lt. (temp. Capt.) L., R.F.C.; Alywin, Qrmr. and Hon. Lt. (temp. Capt.) W. E., R.F.C.; Baker, Temp. Capt. F. J., R.F.C.; Balcombe-Brown, Lt. temp. Maj. R., M.C., R.F.A., Spec. Res. and R.F.C.; Banks, Temp. Capt. J. H., R.F.C.; Barber, Capt. H. C., Gen. List and R.F.C.; Spec. Res.; Barnett, Temp. Lt. A. W., R.F.C.; Bell, Lt. (temp. Capt.) C. H., R.F.C., Spec. Res.; Bell, Sec. Lt. (temp. Lt.) H. G., R.F.C., Spec. Res.; Bell, Lt. T. J., Gen. List and R.F.C.; Bell-Irving, Sec. Lt. (temp. Capt.) A. D., M.C., Gord. Hghrs. and R.F.C.; Bell-Irving, Capt. (temp. Lt.-Col.) R., Can. Local Forces and R.F.C.; Bentley, Temp. Capt. H. M., Gen. List and R.F.C.; Billingham, Sec. Lt. (temp. Lt.) R. W. B., R.F.C., Spec. List; Blackwell, Temp. Sec. Lt. W., Gen. List and R.F.C.; Bonham-Carter, Maj. (temp. Col.) I. M., Northd. Fus. and R.F.C.; Botterill, Lt. (temp. Capt.) J. J., R.F.C., Spec. Res.; Bowen, Capt. (temp. Lt.-Col.) J. B., Pembroke Yeo. and R.F.C.; Briggs, Lt. J. C., Leic. R. and R.F.C.; Brooker, Sec. Lt. (temp. Lt.) F. D., R.F.C., Spec. Res.; Brown, Sec. Lt. G. W. A., R.F.C., Spec. Res.; Brown, Temp. Capt. W. J. C., R.F.C.; Browne, Sec. Lt. (temp. Capt.) H. A., R.F.C., Spec. Res.; Buck, Lt. (temp. Capt.) F. C., R.F.C., Spec. Res.; Buckeridge, Temp. Maj. N. F. D., R.F.C.; Bullock, Sec. Lt. (temp. Lt.) H. C. S., R.F.C.; Burch, Bt. Lt.-Col. (temp. Col.) W. E. S., R.F.C. (Res. of Officers); Burt, Temp. Capt. J. W., R.F.C.; Butler, Lt. (temp. Capt.) H. J., R.F.C., Spec. Res.; Butler-Stoney, Maj. C. K., R.F.C., T.F. Res.; Butter, Capt. (temp. Maj.) C. A. J., Sco. Horse Yeo. and R.F.C.

Callard, Temp. Capt. P. R., Gen. List and R.F.C.; Campbell, Capt. (temp. Maj.) C. D. M., R.F.C., Spec. Res.; Candy, Temp. Capt. R. G. L., Gen. List and R.F.C.; Capelli, Temp. Capt. P. P., Gen. List and R.F.C.; Carr, Lt. (temp.

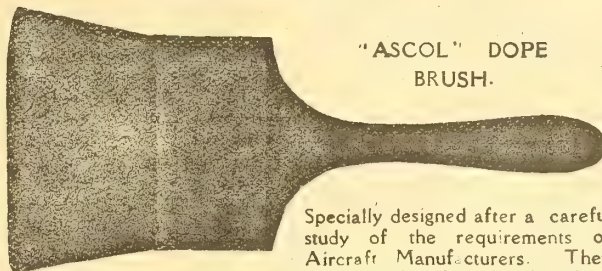




WE CAN DELIVER FROM STOCK THE FOLLOWING "ASCOL" SPECIALITIES.—

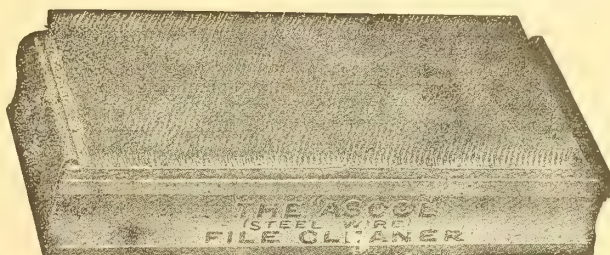


**FACTORY STOOL**  
(Wood).  
24 in. high - 6/6 each.



"ASCOL" DOPE  
BRUSH.

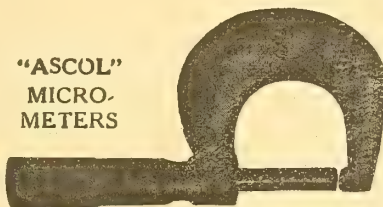
Specially designed after a careful study of the requirements of Aircraft Manufacturers. They are made of the finest bristles which are firmly set in the handles.  
2in. 2/6, 3in. 4/-, 4in. 5/- each.



"ASCOL" FILE CLEANERS.

The bristles are made of steel wire and the effect of its use, particularly on files which have been used for soft metals, is almost equal to re-cutting 8/6 per dozen.

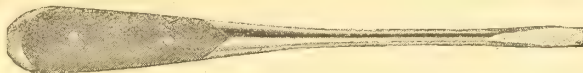
"ASCOL"  
MICRO-  
METERS



1 in. .. 30/-; 2 in. .. 32/6



ENGINE BRUSHES. 8/6 and 9/6 per dozen.



"ASCOL" SCREW DRIVERS

Strongly made of solid steel throughout with rivetted wooden handles.  
6 in. ... 8/9 per doz. 8 in. ... 13/- per doz. 10 in. ... 16/6 per doz.

"ASCOL" LEAFLETS.—We have now ready a large range of illustrated leaflets dealing with "Ascol" Specialities. These include "Ascol" Micrometers, Factory Stools, File Cleaners, Avro Parts (Washers and Eye-bolts), Safety Belts, Dope Brushes, etc., etc. The leaflets are supplied in a neat and useful case and will be sent free to the industry upon application on business stationery.

## THE AIRCRAFT SUPPLIES COMPANY LTD

CONTRACTORS TO THE AIR BOARD.

Head Offices, Showrooms, and Stores:

**ASCOL HOUSE, 125, LONG ACRE, LONDON, W.C.2.**

Representatives in Birmingham, Manchester, Leeds, Belfast, Northern Counties and Scotland, South Coast and the London District.

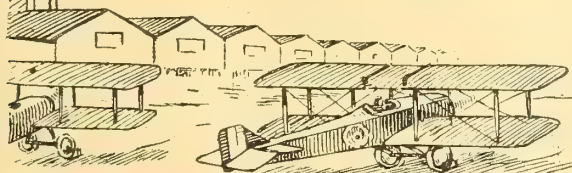
Managing Director:  
G. H. MANSFIELD.

Works:  
Little James St.  
London, W.C.1.



Telephone:  
Gerrard 276  
(Private Branch Exchange.)

Telegrams:  
"Upcast, Rand."  
London.



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



Maj.) R. H., R.F.C., Spec. Res.; Caster, Lt. (temp. Capt.) W. S., M.C., Hunts. Cyc. Bn. and R.F.C.; Chamier, Maj. J. A., D.S.O., Punjabis and R.F.C.; Chaney, Lt. (temp. Maj.) H. E., Lanc. Fus. and R.F.C.; Charlton, Bt. Lt.-Col. (temp. Brig-Gen.) L. E. O., C.M.G., D.S.O., Lanc. Fus. and R.F.C.; Clarke, Capt. (temp. Maj.) A. C., Welsh R. and R.F.C.; Coales, Sec. Lt. J. D., R.F.C., Spec. Res.; Conner, Maj. (temp. Lt.-Col.) D. G., R.A. and R.F.C.; Creswell, Capt. (temp. Maj.) F. S., R.F.C., Spec. Res.; Crichton, Temp. Capt. H. L., Gen. List and R.F.C.; Cronshaw, Lt. (temp. Capt.) W. N., E. Lanc. R. and R.F.C.; Cumming, Temp. Sec. Lt. (temp. Capt.) W. M., R.F.C.

Darby, Capt. M. O., R.F.C., Spec. Res.; Davenport, Lt. (temp. Capt.) S., R.F.C., Spec. Res.; Day, Sec. Lt. (temp. Capt.) A. C., R.F.C., Spec. Res.; Defries, Capt. (temp. Maj.) C., R.F.C., Spec. Res.; Disney, Capt. H. A. P., Camb. R. and R.F.C.; Drabble, Sec. Lt. (temp. Capt.) C. H., R.F.C., Spec. Res.; Drysdale, Lt. J. M., R.F.C., Spec. Res.; Dundas, Temp. Capt. Lord G. H. L., R.F.C. (Res. of Officers).

Ebben, Capt. (temp. Maj.) H. S., R.F.C., Spec. Res.; Egerton, Temp. Capt. Hon. W. C. W., R.F.C.; Ellis, Capt. (temp. Maj.) A., R.E. and R.F.C.; Ellis, Temp. Sec. Lt. D. C., Gen. List and R.F.C.; Ewen, Temp. Capt. W. H., Spec. List and R.F.C.

Fleming-Williams, Temp. Capt. C. R., R.F.C., Spec. Res.; Fletcher, Qrmr. and Hon. Capt. (temp. Lt.-Col.) A., M.C. R.F.C.; Forson, Lt. A., R. Sco. Fus. and R.F.C.

Gallop, Lt. R. C., Sco. Rif. and R.F.C.; Gold, Capt. (temp. Maj.) H. G., R.F.C., Spec. Res.; Gunyon, Temp. Lt. C. P. H., Gen. List and R.F.C.

Halford, Sec. Lt. (temp. Capt.) E. S., R.F.C., Spec. Res.; Hannay, Lt. (temp. Maj.) G. D., R.F.C.; Spec. Res.; Harber, Temp. Capt. L. G., R.F.C.; Hartley, Sec. Lt. (temp. Lt.) A. C., R.F.C., Spec. Res.; Hartley, Lt. (temp. Maj.) A. P., Ches. R. (T.F.) and R.F.C.; Hebben, Capt. (temp. Lt.-Col.) S. A., R.F.C., Spec. Res.; Heenan, Sec. Lt. (temp. Capt.) J. N. D., R.F.C., Spec. Res.; Herbert, Capt. and Bt. Maj. (temp. Brig-Gen.) P. L. W., Notts and Derby R. and R.F.C.; Heyn, Lt. (temp. Capt.) R. G., R.F.C., Spec. Res.; Hiatt, Lt. (temp. Maj.) C. A. A., M.C., Norf. R. and R.F.C.; Howard, Temp. Capt. A. R., R.F.C.; Howard, Temp. Maj. E. J., R.F.C.; Hughes, Sec. Lt. (temp. Capt.) G. F., R.F.C., Spec. Res.; Humphery, Capt. (temp. Maj.) G. E. W., R.F.C., Spec. Res.; Huntley, Temp. Sec. Lt. W. A., R.F.C.

Illingworth, Temp. Lt. M. O., R.F.C.

Jarrott, Capt. (temp. Maj.) C., R.F.C., Spec. Res.; Jenkins, Bt. Maj. (temp. Brig-Gen.) F. C., R.F.C., Spec. Res.; Jennings, Temp. Lt. J. W., R.F.C.; Jones, Lt. (temp. Capt.) B. M., R.E. (T.F.) and R.F.C.

King, Lt. W. J., N. Staffs. R. (temp. Capt.) R.F.C.).

Lang, Sec. Lt. (temp. Capt.) A. B. D., R.F.C., Spec. Res.; Lang, Temp. Lt.-Col. W. H., R.F.C.; Latimer, Sec. Lt. (temp. Capt.) O. W., R.F.C.; Law, Capt. R. D., W. Yorks R. (T.F.) and R.F.C.; Learoyd, Sec. Lt. V. A. B., R.F.C., Spec. Res.; Lee, Capt. (temp. Lt.-Col.) C. F., W. Som. Yeo. and R.F.C.; Lindsay, Temp. Capt. H. E. A., R.F.C.; Livingston, Maj. (temp. Brig-Gen.) G., C.M.G., London R. and R.F.C.; Lumsden, Lt. (temp. Capt.) G. L., Can. Local Forces and R.F.C.; Lyons, Qrmr. and Hon. Capt. (temp. Capt.) T., R.F.C.

MacCallum, Temp. Maj. A. E. G., R.F.C.; MacCallum, Temp. Maj. A. H. S., R.F.C.; McEwen, Capt. (temp. Maj.) B. C., R.F.C., Spec. Res.; Maclean, Capt. (temp. Lt.-Col.) A. C. H., R. Scots and R.F.C.; Main, Capt. (temp. Maj.) G. L., R.F.C., Spec. Res.; Marsh, Temp. Capt. H., R.F.C.; Martyn, Capt. (temp. Lt.-Col.) R. B., M.C., Wilts R. and R.F.C.; Maxwell, Lt. (temp. Capt.) H. K., R.F.C., Spec. Res.; Miller, Temp. Lt. W. D., R.F.C.; Mounsey, Sec. Lt. (temp. Maj.) R. J., Hamps. R. and R.F.C.; Murphy, Sec. Lt. (temp. Lt.) F., R.F.C., Spec. Res.

Nathan, Capt. A. A., Herts Yeo. and R.F.C.; Nevatt, Sec. Lt. (temp. Capt.) C. G., R.F.C., Spec. Res.; Newton-Clare, Temp. Capt. H. J., R.F.C.; Noel, Capt. (temp. Lt.-Col.) F. A. G., R.F.C., Spec. Res.

Ogden, Capt. (temp. Maj.) C. P., R.F.C., Spec. Res.; O'Malley, Lt. (temp. Maj.) H. McD., R.F.C., Spec. Res.

Parker, Temp. Maj. A. H., M.C., R.F.C.; Parker, Sec. Lt. (temp. Maj.) S. E., R.F.C.; Parkin, Qrmr. and Hon. Lt. (temp. Maj.) J. E., R.F.C.; Pethybridge, Lt. (temp. Capt.) W. M., R.F.C., Spec. Res.; Pidgeon, Temp. Capt. G. D., R.F.C., Spec. Res.; Prince, Capt. C. E., Westmd. and Cumbd. Yeo. and R.F.C.; Purvis-Russell-Balfour-Kinnear, Lt. G., R.F.C., Spec. Res.

Read, Capt. (temp. Maj.) G. J. N., Staffs. R. and R.F.C.; Res, Capt. (temp. Maj.) V. O., Lond. R. and R.F.C.; Reid, Sec. Lt. (temp. Lt.) J. S., R.F.C., Spec. Res.; Robb, Sec. Lt. (temp. Capt.) E. E., R.F.C., Spec. Res.; Romanes, Temp. Capt. J., R.F.C.; Rumbold, Sec. Lt. (temp. Maj.) R. S., Som. L.I.

and R.F.C.; Ryan, Qrmr. and Hon. Lt. (temp. Maj.) W. J., R.F.C.

Scott, Lt. (temp. Capt.) T. M., R.F.C., Spec. Res.; Sedgwick, Temp. Capt. L. G. T., Gen. List and R.F.C.; Shaw, Temp. Capt. F. C. O., Gen. List and R.F.C.; Skitt, Lt. (temp. Capt.) M., R.F.A., Spec. Res. and R.F.C.; Sladden, Temp. Sec. Lt. R. J., Gen. List and R.F.C.; Small, Capt. (temp. Lt.-Col.) R. G. D., Leins. R. and R.F.C.; Smart, Temp. Capt. H. G., Gen. List and R.F.C.; Smith, Maj. (temp. Lt.-Col.) S. E., Glouc. R. (T.F.) and R.F.C.; Spencer, Temp. Lt. J. G., Gen. List and R.F.C.; Spittle, Lt. (temp. Maj.) J. T., R.F.C., Spec. Res.; Staggs, Temp. Capt. G. E., Gen. List and R.F.C.; Statter, Capt. (temp. Lt.-Col.) W. E. G., R. Lanc. R. and R.F.C.; Steel, Capt. F., Essex R. and R.F.C.; Stokes, Lt. (temp. Maj.) E., R.F.C., Spec. Res.; Stone, Lt. J. A., Gen. List and R.F.C.

Taylor, Sec. Lt. (temp. Capt.) L. E., R.F.C.; Thomas, Capt. R. W. Lond. R. and R.F.C.; Timmis, Lt. R. H., R.F.C., Spec. Res.; Tizard, Temp. Capt. H. T., Gen. List and R.F.C.; Toye, Temp. Maj. E. G., R.F.C., Spec. Res.; Troup, Lt. J. D., R.F.C., Spec. Res.; Truman, Temp. Maj. L. U. D., Gen. List and R.F.C.; Tully, Temp. Lt. T. B., Gen. List and R.F.C.; Turner, Capt. (temp. Maj.) L. W. F., R.F.C., Spec. Res.

Unwin, Qrmr. and Hon. Lt. (temp. Maj.) F. H., R.F.C.

Vagg, Sec. Lt. (temp. Maj.) H. R., Som. L.I. and R.F.C.

Wakefield, Temp. Maj. H. C., Gen. List and R.F.C.; Walford, Sec. Lt. (temp. Lt.) E. W., R.F.C., Spec. Res.; Waterall, Temp. Capt. H. G., R.F.C.; Webb, Sec. Lt. (temp. Capt.) H. L., R.F.C., Spec. Res.; Whiddington, Capt. R., R.F.C. and T.F. Res.; Williams, Temp. Lt. J. S., M.C., R.F.C.; Wolfe-Barry, Temp. Lt. B. J., R.F.C. (temp. Capt., Spec. List); Wombwell, Lt. A., Linc. R. and R.F.C.; Worswick, Lt. (temp. Capt.) T., R.F.C. Spec. Res.

Allen, No. 3573 Sgt. J., R.F.C.; Antill, No. 1791 Flt. Sgt. C. I., R.F.C.

Banner, No. 9350 Sgt. C. H., R.F.C.; Bashford, No. 56421 Temp. Sgt.-Maj. E. V., R.F.C.; Beavor, No. 1790 Flt. Sgt. C. D., R.F.C.; Booker, No. 26111 Temp. Sgt.-Maj. W. V., R.F.C.; Bowmer, No. 51336 Flt. Sgt. W. R., R.F.C.; Bradley, No. 2072 Temp. Sgt.-Maj. W., R.F.C.; Breese, No. 8679 Flt. Sgt. T. A., R.F.C.; Brigden, No. 13014 Flt. Sgt. F. G., R.F.C.; Brotherston, No. 6954 Sgt. R. W., R.F.C.; Burns, No. 29854 Qrmr.-Sgt. H. J., R.F.C.; Byrne, No. 45727 Temp. Sgt.-Maj. N., R.F.C.

Calnan, No. 3706 Temp. Sgt.-Maj. F., R.F.C., Camp, No. 7183 Temp. Sgt.-Maj. G. E., R.F.C.; Campbell, No. 5867 Temp. Sgt.-Maj. D., R.F.C.; Chorley, No. 9321 Sgt. H. B., R.F.C.; Clayton, No. 87947 Temp. Sgt.-Maj. H. A., R.F.C.; Condict, No. 2434 Flt. Sgt. S. T., R.F.C.; Conyard, No. 27770 Sgt. G. A., R.F.C.; Cooper, No. 57017 Cpl. R., R.F.C.; Cordeaux, No. 859 Temp. Sgt.-Maj. A., R.F.C.; Croft, No. 6816 Temp. Sgt. Maj. H. W., R.F.C.; Crooks, No. 44071 Flt. Sgt. J. W., R.F.C.; Cross, No. 40291 Cpl. (actg. Sgt.) W. A., R.F.C.

Dann, No. 28470 Flt. Sgt. R. H., R.F.C.; Dempsey, No. 8513 Sgt. J., R.F.C.; Dexter, No. 27687 Sgt. G. R., R.F.C.; Duffey, No. 554 Flt. Sgt. J. T., R.F.C.

Erskine, No. 25051 Temp. Sgt.-Maj. A., R.F.C.

Frost, No. 57432 Sgt. W., R.F.C.

George, No. 5404 Flt. Sgt. T., R.F.C.; Grabaskey, No. 11839 Temp. Sgt.-Maj. H. P., R.F.C.; Green, No. 5025 Sgt. J. H. R., R.F.C.; Griffiths, No. 3839 Temp. Sgt.-Maj. J., R.F.C.; Gulliver, No. 6581 Cpl. F., R.F.C.

Harfleet, No. 10786 Temp. Sgt.-Maj. J. H., R.F.C.; Harris, No. 16779 Flt. Sgt. J. H., R.F.C.; Hayden, No. 10465 Temp. Sgt.-Maj. A. D. R., R.F.C.; Heeley, No. 26067 Cpl. G. H., R.F.C.; Henderson, No. 25012 Temp. Sgt.-Maj. E., R.F.C.; Hill, No. 30209 Flt. Sgt. H. C., R.F.C.; Hill, No. 2956 Temp. Sgt.-Maj. W., R.F.C.; Hodgson, No. 1273 Temp. Sgt.-Maj. T., R.F.C.; Holmes, No. 9725 Temp. Sgt.-Maj. L. H., R.F.C.

Jackson, No. 485 Temp. Sgt.-Maj. E. D., R.F.C.; James, No. 15555 Sgt. A. H., R.F.C.; Johnson, No. 2258 Sgt. A., R.F.C.; Jones, No. 14807 Temp. Sgt.-Maj. H., R.F.C.

Kellam, No. 13723 Cpl. G. C., R.F.C.; Kellaway, No. 6558 Flt. Sgt. A. F., R.F.C.; Kerr, No. 5062 Flt. Sgt. J., R.F.C.

Lee, No. 8099 temp. Sgt.-Maj. H., R.F.C.; Lenney, No. 12190 Flt. Sgt. A., R.F.C.; Littlewood, No. 399 Flt. Sgt. W. St. J., R.F.C.; Lloyd, No. 21338 Flt. Sgt. J., R.F.C.; Lomas, No. 42490 Cpl. T. E., R.F.C.

Mace, No. 23884 Sgt. L. G., R.F.C.; Mackie, No. 3803 Flt. Sgt. D., R.F.C.; Magee, No. 21027 Sgt. W., R.F.C.; Major, No. 4637 Temp. Sgt.-Maj. J., R.F.C.; Manton, No. 19002 Sgt. H. E. C., R.F.C.; Mathews, No. 6561 Flt. Sgt. W., R.F.C.; Morley, No. 18998 Flt. Sgt. A. C., R.F.C.

Nevill, No. 33244 Flt. Sgt. A., R.F.C.; Newbold, No. 27489 Cpl. S. W., R.F.C.; Newton, No. 45848 Temp. Sgt.-Maj. R., R.F.C.; Nuttall, No. 40698 Sgt. J., R.F.C.

Pearce, No. 1653 Flt. Sgt. L. F. T., R.F.C.; Pearman, No. 5377 Sgt. (actg. Flt. Sgt.) W., R.F.C.; Pinder, No. 57555



# EMAILLITE

NON-POISONOUS

AEROPLANE DOPE.

THE ORIGINAL AND STILL THE PREMIER.

AS  
TIGHT



Trade Mark.

AS  
A DRUM.

THE BRITISH EMAILLITE CO., LTD.,

*Contractors to the Air Board.*

Registered Offices:

30, Regent Street, Piccadilly, S.W.1.

Wire—"Ridleyppren Piccy, London."

"Phone—280 Gerrard

Works

5, Hythe Road, Cumberland Park,  
Willesden Junction, N.W.10.

Telephone—Willesden 2346 & 2347.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



Qrmr.-Sgt. H. W., R.F.C.; Piper, No. 9605 Temp. Sgt.-Maj. H. M. (now temp. Sec. Lt., Gen. List), R.F.C.; Polley, No. 21033 Flt. Sgt. G. E., R.F.C.; Pybus, No. 3425 Flt. Sgt. H., R.F.C.

Ranford, No. 22239 Sgt. V. B., R.F.C.; Read, No. 63701 Sgt. W. H., R.F.C.; Rees, No. 61318 Cpl. T., R.F.C.; Richardson, No. 350 Flt. Sgt. J. G., R.F.C.; Richardson, No. 57582 Sgt. T. J., R.F.C.; Roberts, No. 69753 3rd Air Mech. R., R.F.C.; Rogers, No. 57588 Flt. Sgt. A., R.F.C.; Rose, No. 46140 Cpl. W. T., R.F.C.; Russ, No. 28267 Sgt. F. V., R.F.C.

Saddler, No. 47712 Temp. Sgt.-Maj. J. M., R.F.C.; Sadler, No. 21153 Sgt. R., R.F.C.; Scott, 235 Temp. Sgt.-Maj. A. E., R.F.C.; Sherman, No. 21712 Cpl. H., R.F.C.; Simmons, No. 37726 Cpl. W., R.F.C.; Slade, No. 21 Temp. Sgt.-Maj. E., R.F.C.; Smith, No. 2646 Temp. Sgt.-Maj. A. C., R.F.C.; Smith, No. 6124 Flt. Sgt. D., R.F.C.; Smith, No. 11697 Sgt. (actg. Flt. Sgt.) F. B., R.F.C.; Snead, No. 26163 Flt. P. J., R.F.C.; Spillman, No. 18327 Flt. Sgt. L. J., R.F.C.; Stapley, No. 7701 Qrmr.-Sgt. E. W. R., R.F.C.; Starford, No. 57615 Sgt. S., R.F.C.; Strong, No. 11080 Flt. Sgt. W. E., R.F.C.

Taylor, No. 3482 Sgt. J. A., R.F.C.; Townsend, No. 7025 temp. Sgt.-Maj. W. E., R.F.C.

Vandenberg, No. 43642 Sgt. A. P., R.F.C.; Vint, No. 2976 temp. Sgt.-Maj. A. G. H., R.F.C.

Walden, No. 9030 Flt. Sgt. H., R.F.C.; Wannop, No. 78674 Temp. Sgt.-Maj. J., R.F.C.; Watson, No. 2157 Temp. Sgt.-Maj. E. C., R.F.C.; Watts, No. 2296 Flt. Sgt. L. G., R.F.C.; Westbrook, No. 8104 Flt. Sgt. H. W., R.F.C.; Weston, No. 1412 Sgt. G. W., R.F.C.; Wheatley, No. 1652 Flt. Sgt. S. H., R.F.C.; Williams, No. 19292 Temp. Sgt.-Maj. A. B., R.F.C.; Williams, No. 6234 Flt. Sgt. H. A., R.F.C.; Willis, No. 19111 Sgt. F., R.F.C.; Wileson, No. 3854 Sgt. J., R.F.C.; Wilson, No. 26155 Temp. Sgt.-Maj. J. S. F., R.F.C.; Winney, No. 1098 Flt. Sgt. S. V., R.F.C.; Woodcock, No. 4258 Sgt. H. W., R.F.C.; Wyatt, No. 3580 Flt. Sgt. A. E., R.F.C.

#### AUSTRALIAN IMPERIAL FORCE.

Aust./120 Sgt. B. F. Jones, F.C.

Aust./20 Sgt. R. Lonsdale, F.C.

Aust./1750 1st Cl. A/M H. S. Raphael, F.C.

#### WAR OFFICE, March 14th.

REGULAR FORCES—ESTABLISHMENTS—R.F.C.—MIL. WING.—Flt. Comdr.—Lt. W. Deane, Norf. R., T.F., from a Flying Officer, and to be temp. Capt. while so empld., Feb. 13th.

ASST. INSTRS. IN GUNNERY.—Graded as Equipt. Officers, 3rd Cl.—Lt. F. H. Astle, Ches. R., T.F., from a Flying Officer; Lt. F. D. Owen, Lond. R., T.F., and to be sec'd.; Temp. Sec. Lt. F. E. Glass, Gen. List, from an Equipt. Officer, 3rd Cl.; Temp. Sec. Lt. G. R. Waters, Gen. List, from a Flying Officer (Observer); Temp. Sec. Lt. W. St. George, Gen. List, from a Flying Officer; Temp. Sec. Lt. D. D. Lockwood, Gen. List, from a Flying Officer (Feb. 5th); Temp. Sec. Lts. (on prob.), Gen. List, and to be confirmed in their rank: J. F. Richardson, A. Wallas, J. J. Wilson.

Gen. List.—Temp. Sec. Lt. W. C. Bersey to be temp. Lt.-Col. (without pay or allowances of that rank) whilst specially empld. March 15th; Lt. S. Smith, from R.N.V.R., to be temp. Capt., Jan. 25th.

MEMORANDA.—To be temp. Majors:—While empld. as Dept. Asst. Dirs. at the War Office:—Lt. (temp. Capt.) F. B. Burton, R.F.C., Spec. Res.; Sec. Lt. (temp. Capt.) H. A. Browne, R.F.C., Spec. Res.

#### WAR OFFICE, March 15th.

REGULAR FORCES—ESTABLISHMENTS—R.F.C.—MIL. WING.—Flt. Comdrs.—From Flying Officers:—Temp. Capt. A. G. Waller, Gen. List; Lt. S. B. Collett, Durh. L.I., T.F., and to be temp. Capt. while so empld., Feb. 12th.

ASST. INSTRS. IN GUNNERY.—Graded as Equipt. Officers, 3rd Cl.—Temp. Lt. H. M. Avres, attd. Middx. R., from a Flying Officer; Lt. G. Moon, R.E., T.F.; Temp. Lt. E. F. Boulthbee, M.G. Corps, and to be transfd. to R.F.C., Gen. List; Lt. H. Coverdale, Lond. R., T.F., and to be sec'd.; Lt. T. McClelland, Cyclist Bn., T.F., and to be sec'd.; Temp. Sec. Lt. J. N. Longfield, Lan. Fus., and to be transfd. to R.F.C., Gen. List; Sec. Lt. J. Rimmer, Spec. Res., from a Flying Officer; Temp. Sec. Lt. A. H. Waterman, Gen. List, from a Flying Officer, Feb. 5th; Temp. Sec. Lts. (on prob.) Gen. List, and to be confirmed in their rank: M. C. S. Bowley, A. B. Taylor, Feb. 5th.

Equipt. Officers, 1st Cl.—From the 2nd Cl., and to be temp. Cpts. whilst so empld.—Lt. L. G. P. Warren, Spec. Res., Lt. J. F. Luscombe, Spec. Res., Jan. 1st; Sec. Lt. (temp. Lt.) F. J. H. Palmer, Spec. Res. (Jan. 29th); Sec. Lt. (temp. Lt.) H. R. Brutey, Spec. Res., Temp. Lt. F. G. J. Didden, Gen. List, Feb. 1st; Lt. F. M. Iredale, Spec. Res. (Feb. 11th); Lt. F. J. Game, Spec. Res., from a special appt. (graded as an Equipt. Officer, 2nd Cl.) Feb. 22nd.

SCHOOLS OF INSTN.—SCHOOLS OF MIL. AERONAUTICS.—Comdr.

Maj. C. P. Rooke, D.S.O., Middx. R., Spec. Res., and to be temp. Lt.-Col. whilst so empld., Jan. 14th.

Gen. List.—Maj. H. A. Petre, D.S.O., M.C., from Australian Flying Corps, to be temp. Maj., Feb. 1st.

To be temp. Sec. Lt.:—Serjt. W. J. Beer, from R.F.C. (since killed), Nov. 25th, 1917.

#### ADMIRALTY, March 16th.

The King has been pleased to approve of the award of the following honours, decorations, and medals to Officers and Men of the Royal Naval Air Service:—

#### A BAR TO THE DISTINGUISHED SERVICE ORDER.

Sqdn. Comdr. E. R. MOON, D.S.O., R.N.A.S.

In recognition of the resource and gallantry displayed by him in the following circumstances:—On Jan. 6th, 1917, whilst on a reconnaissance flight over the Rufiji Delta with Comdr. the Hon. R. O. B. Bridgeman, D.S.O., R.N., as observer, he was obliged by engine trouble to descend in one of the creeks, where it became necessary to destroy the seaplane to avoid the possibility of its being captured. For three whole days the two officers wandered about the delta in their efforts to avoid capture and to rejoin their ship. During this time they had little or nothing to eat, and were continually obliged to swim across the creeks, the bush on the banks being impenetrable. On the morning of Jan. 7th they constructed a raft of three spars and some latticed window-frames. After paddling and drifting on this for the whole of Jan. 7th and 8th, they were finally carried out to sea on the morning of the 9th, when Comdr. Bridgeman, who was not a strong swimmer, died of exhaustion and exposure. In the late afternoon Flt. Comdr. Moon managed to reach the shore, and was taken prisoner by the Germans. He was released from captivity on Nov. 21st, 1917. He displayed the greatest gallantry in attempting to save the life of his companion.

#### THE DISTINGUISHED SERVICE CROSS.

Flt. Comdr. R. B. MUNDAY, R.N.A.S.

For courage and initiative. Offensive patrols under his able and determined leadership have consistently engaged enemy aircraft, and he has displayed the utmost courage in carrying out special missions alone, both by day and by night. On Feb. 21st, 1918, he attacked a new type enemy two-seater machine. The enemy machine dived steeply east, and Flt. Comdr. Munday followed and closed in, firing a long burst at close range, after which the enemy went down vertically out of control. On other occasions he has brought down enemy machines completely out of control, and has set fire to and destroyed enemy kite balloons both by day and night. On one occasion he attacked an enemy kite balloon at night, and destroyed both the balloon and its shed by fire.

Flt. Lt. (actg. Flt. Comdr.) M. J. G. DAY, R.N.A.S. (since killed).

For great skill and bravery as a fighting pilot. On Jan. 25th he attacked, single-handed, six enemy triplanes, one of which he shot down. On Feb. 2nd, 1918, he attacked and destroyed an enemy two-seater machine on reconnaissance at 18,000 ft. He destroyed several enemy machines in a short space of time, and, in addition, had numerous indecisive engagements.

Flt. Lt. E. E. DEANS, R.N.A.S.

In recognition of great skill and bravery in flying machines of an old type in East Africa. He has carried out some very useful and long flights, and has completed his reconnaissances even when the machine has been practically uncontrollable through "bumps." He has been eager and ready to go up at all times, and has shown no thought of personal danger.

Flt. Sub-Lt. E. G. JOHNSTONE, R.N.A.S.

For the pluck and determination shown by him in engaging enemy aircraft. On Jan. 19th, 1918, he attacked five Albatros scouts, and engaged one, nose on, opening fire at 75 yards range. The enemy aircraft turned on its side and spun. He followed, and engaged again at 30 yards range. The enemy aircraft went down completely out of control. Later in the day, in a general engagement with 14 Albatros scouts, he followed one down to 8,000 ft., firing all the time. This is confirmed by other pilots of the patrol to have fallen completely out of control. On several other occasions he has destroyed enemy machines or brought them down completely out of control.

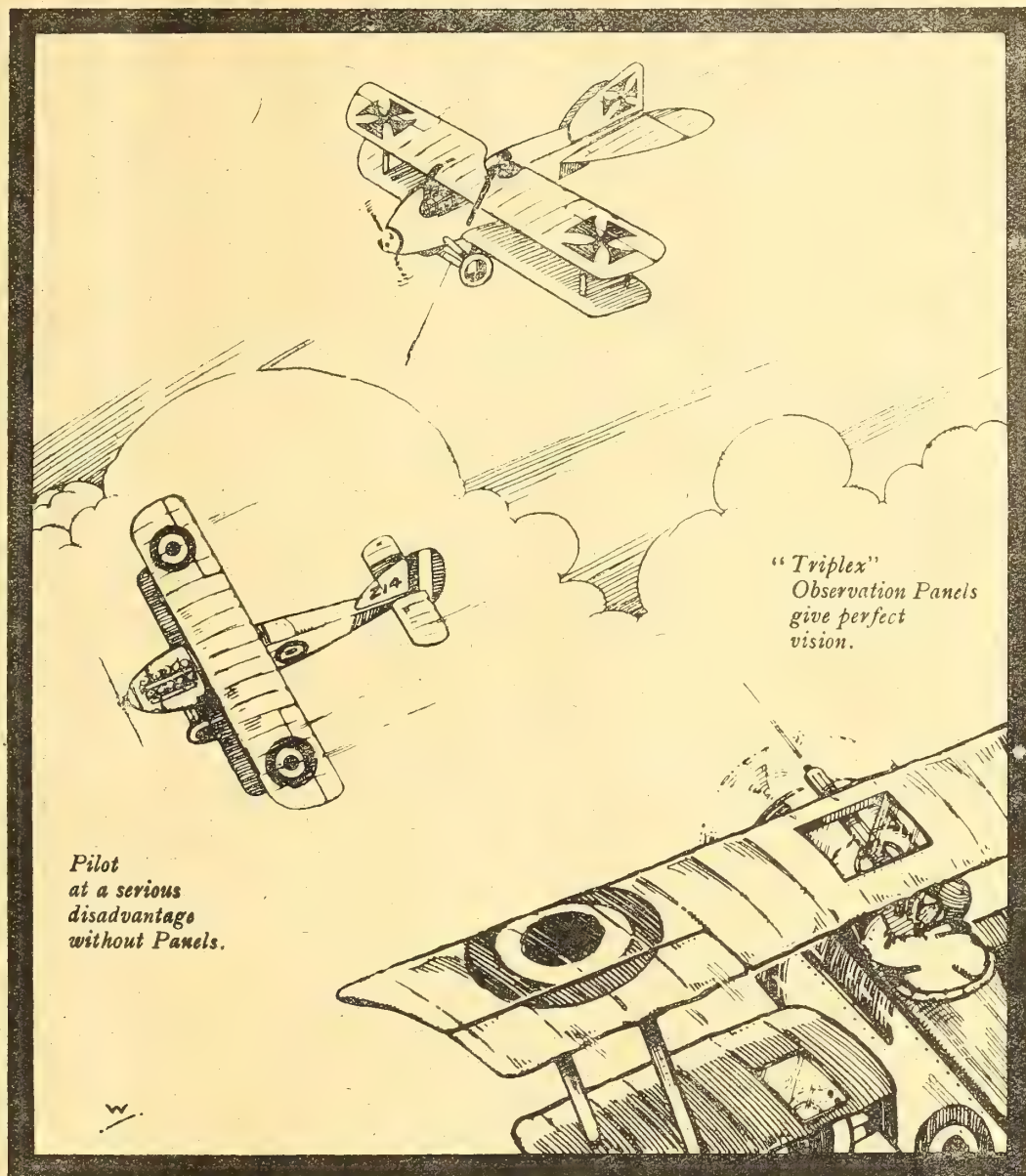
#### A BAR TO THE DISTINGUISHED SERVICE CROSS.

Flt. Comdr. G. W. PRICE, D.S.C., R.N.A.S.

For consistency and determination in attacking enemy aircraft, often in superior numbers. On Jan. 22nd, 1918, when on offensive patrol, he observed seven Albatros scouts. He dived and fired into one of the enemy aircraft, which stalled, side-slipped, and eventually fell over on its back, disappearing through a thick bank of clouds, and was observed by others of our machines to fall completely out of control. On several other occasions he has destroyed enemy machines or brought them down completely out of control.



## THE CASE FOR "TRIPLEX."



# “TRIPLEX” SAFETY GLASS

for Aeroplane Observation Panels in upper and lower planes, Goggles, Windscreens, etc. Cannot “fly” or splinter, and always remains perfectly intact no matter how badly smashed.

THE “TRIPLEX” SAFETY GLASS CO., Ltd.  
(REGINALD DELPECH, MANAGING DIRECTOR)  
 1, ALBEMARLE ST., PICCADILLY, LONDON, W.1.

CONTRACTORS TO H.M. ADMIRALTY & WAR OFFICE.



Flt. Lt. (actg. Flt. Comdr.) W. A. CURTIS, D.S.C., R.N.A.S.

For continuous skill and courage as a fighting pilot. On Jan. 23rd, 1918, whilst on offensive patrol, he followed three two-seater enemy machines and an enemy scout through the clouds. The enemy were then joined by five other scouts. He dived and fired into an enemy two-seater from about 40 ft. behind. The enemy machine fell over on its side and started to spin, and was observed by another pilot to break up in the air while spinning down. Since the award of the Distinguished Service Cross this officer has destroyed several enemy machines and driven down others absolutely out of control.

Flt. Lt. W. L. JORDAN, D.S.C., R.N.A.S.

For skill and determination when leading offensive patrols. On Jan. 6th, 1918, when on offensive patrol he observed 10 Albatros scouts. The enemy dived and spread out, and Flt. Lt. Jordan, in conjunction with another pilot, attacked one, into which he fired at close range, sending it down in a side-slipping dive. On numerous other occasions he has attacked enemy aircraft with great dash and gallantry, and has destroyed or sent them down out of control.

A SECOND BAR TO THE DISTINGUISHED SERVICE CROSS.

Flt. Comdr. R. J. O. COMPSTON, D.S.C., R.N.A.S.

For ability and determination when leading offensive patrols, in which he displays entire disregard of personal danger. On Jan. 1st, 1918, he observed a new type twin-tailed two-seater enemy machine, which he attacked, firing a good many rounds at point blank range. The enemy machine dived, but was again attacked and went down vertically with his engine full on. The wings came off, and the machine was observed to crash. Later in the day Flt. Comdr. Compston observed two formations of 10 and five Albatros scouts respectively. He attacked one of the enemy machines and sent it down in a flat spin and falling over sideways completely out of control. On numerous other occasions Flt. Comdr. Compston has destroyed or driven down enemy machines completely out of control, and has frequently had more than one successful engagement in the same day.

THE DISTINGUISHED SERVICE MEDAL.

C.P.O. 1st Cl. (now Warrr. Officer, 2nd Gr.), W. Dickison, O.N. 272318 (Ch.); Air Mech. 2nd Gr., G. H. Robinson, O.N. F.26879.

\* \* \*

The following Officers have been mentioned in dispatches:—

Wing Comdr. R. H. Mulock, D.S.O., R.N.A.S.; Flt. Comdr. C. E. Wood, R.N.A.S. (killed).

\* \* \*

CONFERRED BY THE KING OF THE HELLENES.

ORDER OF THE REDEEMER.—COMMANDER.

Capt. F. R. Scarlett, D.S.O., R.N.

CORRECTIONS.

In "Gazette" of Feb. 22nd, under Decorations Conferred by the King of the Belgians, for Order of the Crown—Commander, read Order of the Crown—Chevalier, and for Flt. Lt. E. J. K. Buckley, R.N.A.S. (since killed) read Flt. Sub-Lt. E. J. K. Buckley, R.N.A.S. (since killed).

WAR OFFICE, March 16th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—MIL. WING.—Equipt. Officers, 1st Cl.—From the 2nd Cl., and to retain their temporary rank whilst so empld.:—Lt. (temp. Capt.) P. L. Hunting, Northd. Fus., T.F., Feb. 1st; Lt. (temp. Capt.) M. Hodge, Spec. Res., Feb. 15th.

Experimental Officer, 3rd Cl.—(Graded as an Equipt. Officer, 3rd Cl.)—Sec. Lt. R. C. S. Jamie, Spec. Res., Oct. 18th, 1917.

Gen. List.—To be temp. Sec. Lts.:—2nd Cl. Air Mech. D. J. Fleming, from R.F.C., Dec. 6th, 1917; 1st Cl. Air Mech. (actg. Cpl.) W. J. Barker, from R.F.C.; 1st Cl. Air Mech. H. A. Blaquiere, from R.F.C., Dec. 13th, 1917.

MEMORANDA.—To be temp. Majors:—While empld. as Dep. Asst. Dirs. at the War Office:—Sec. Lt. (temp. Capt.) E. E. Robb, R.F.C., Spec. Res.

Qrmmrs. and Hon. Lts., R.F.C., to be Hon. Capt.:—J. Starling (temp. Lt.-Col.), A. Levick (temp. Maj.), A. H. Measures (temp. Lt.-Col.), F. H. Unwin (temp. Maj.), J. H. Wilford (temp. Maj.), W. R. Bruce (temp. Maj.), W. J. Ryan, M.B.E. (temp. Maj.), March 1st.

Temp. Qrmmr. and Hon. Lt. S. C. Parr (temp. Maj.), R.F.C., to be Hon. Capt., Nov. 5th, 1917.

WAR OFFICE March 18th.

REGULAR FORCES.—ESTABLISHMENTS.—R.F.C.—MIL. WING.—STAFF MEMORANDUM.—Temp. Lt.-Col. A. C. Critchley, D.S.O., Canadian Cav., to be temp. Brig-Gen. whilst seed for duty with the R.F.C., March 4th.

Flt. Comdr.—Sec. Lt. R. J. Brownell, Spec. Res., from a Flying Officer, and to be temp. Capt. whilst so empld. (Feb. 11th). Park Comdr.—Temp. Capt. A. R. Earle, Gen. List, from an Equipt. Officer, 1st Cl., and to be temp. Maj. whilst so empld. (Dec. 3rd, 1917).

Equipt. Officers, 1st Cl.—The rank of Sec. Lt. (temp. Capt.)

J. P. Angell is as now described, and not as in the "Gazette" of Dec. 17th, 1917.

SCHOOLS OF INSTRN. SCHOOL OF TECHNICAL TRAINING.—Co. Comdr.—Graded as an Equipt. Officer, 2nd Cl.—Lt. D. C. G. Sharp, R.A., to be seed., and to be temp. Capt. (without the pay or allowances of that rank) whilst so empld., Feb. 6th.

SCHOOLS OF SPECIAL FLYING.—Comdt.—Graded as a Wing Comdr.—Capt. (temp. Brig-Gen.) R. R. Smith-Barry, Spec. Res., relinquishes his temp. rank, and to be temp. Lt.-Col. whilst so empld. (Feb. 23rd, seny. from Aug. 23rd, 1917).

Gen. List.—Co. Comdrs. (graded as Equipt. Officers, 2nd Cl.), School of Technical Training, to be temp. Capt. (without the pay or allowances of that rank) whilst so empld.: Temp. Lt. P. P. C. Penberthy, Gen. List; Lt. G. J. Dewhurst, K.R. Rif. C., Spec. Res.; Lt. E. G. Etheridge, Suff. R., T.F.; Temp. Lt. L. L. Wight, M.C., E. Surr. R.; Temp. Lt. J. W. Cairns, Gen. List; Temp. Lt. G. W. Allen, Gen. List; Lt. N. Macgregor, Arg. and Suthd. Highrs., T.F. (Sept. 24th, 1917); E. Smith, to be temp. Sec. Lt. (on prob.), March 1st.

MEMORANDUM.—G. J. Grierson to be temp. hon. Lt. whilst empld. as Asst. Insp., Aeronautical Inspn. Dept. (July 18th, 1917).

OVERSEA CONTINGENTS.—CANADA.—BRITISH COLUMBIA R.—Temp. Lt. to be temp. Capt.: J. P. Alexander, and to remain seed. with the R.F.C.

CENT. ONTARIO R.—Temp. Capt. M. R. Taylor resigns his commn. and ceases to be seed. for duty with the R.F.C. on transfer to the American Air Service, Feb. 1st.

## FROM THE COURT CIRCULAR.

BUCKINGHAM PALACE, March 13th.

The King held an Investiture of the Most Excellent Order of the British Empire at 10.30 o'clock this morning.

The following were severally introduced into the presence of His Majesty, when The King invested them with the Insignia of the Division of the Order into which they have been admitted:—

### OFFICERS.

Wing-Comdr. Alec Ogilvie, R.N.A.S.

Wing-Comdr. Charles Pollock, R.N.A.S.

BUCKINGHAM PALACE, March 14th.

The King and Queen, attended by the Dowager Countess of Airlie, Lt.-Col. Clive Wigram and Maj. Reginald Seymour, visited the Works of Messrs. Clement Talbot, Limited, this morning, where Their Majesties were received by the Chairman (The Earl of Shrewsbury and Talbot).

Maj. C. S. Paulet (representing the Ministry of Munitions), and Maj. C. Hirtzel, R.F.C. (representing the Air Ministry), were also in attendance upon The King and Queen.

BUCKINGHAM PALACE, March 16th.

The following officers had the honour of being received by the King this morning, when His Majesty invested them with the Insignia of the respective Divisions of the Orders into which they have been admitted:—

THE MOST HONOURABLE ORDER OF THE BATH—CIVIL DIVISION.—Knight Commander.—Commodore Godfrey Paine, R.N.

THE DISTINGUISHED SERVICE ORDER.—Capt. Francis Scarlett, R.N.; Sec. Lt. William Joffe, The King's Own (Y.L.I.), attd. R.F.C.

The King then conferred decorations as follows:—

THE DISTINGUISHED SERVICE CROSS.—Flt. Lt. Thomas Wood, R.N.A.S.

THE MILITARY CROSS AND BAR.—Capt. Byron Jacobs, The Buffs, attd. R.F.C.; Capt. Clarence Brisco-Owen, R.E., attd. R.F.C.

THE MILITARY CROSS.—Maj. John Hunter, R.F.C.; Maj. Wilfred McCloughry, A.F.C.; Capt. Reginald Charley, R.F.C.; Capt. Reginald Fulljambes, R.F.C.; Capt. Herbert Harman, R.F.C.; Capt. Bernard Jones, Oxford. and Bucks. L.I., attd. R.F.C.; Capt. James Selby, R.F.A. and R.F.C.; Capt. John Stevenson, R.F.C.; Lt. Vincent McMahon, R. Dublin Fus., attd. R.F.C.; Lt. James Melhuish, Worc. R. and R.F.C.; Lt. Tom Noel, King's Own Scottish Bord., attd. R.F.C.; Lt. Thomas Williams, Yeo., attd. R.F.C.; Sec. Lt. Reginald Watling, Essex R., attd. R.F.C.

### NAVAL.

The following appointments have been made in the Royal Naval Air Service:—

MARCH 13th.—STAFF PAYRS.—H. B. Bonning, to President, addl., for Air Ministry (March 12th).

### ADMIRALTY COMMUNIQUE.

MARCH 13th.—On the night of March 11th a bombing raid was carried out by naval aircraft on Bruges Docks. Over three tons of bombs were dropped on the objective, but, owing to poor visibility, results could not be observed.

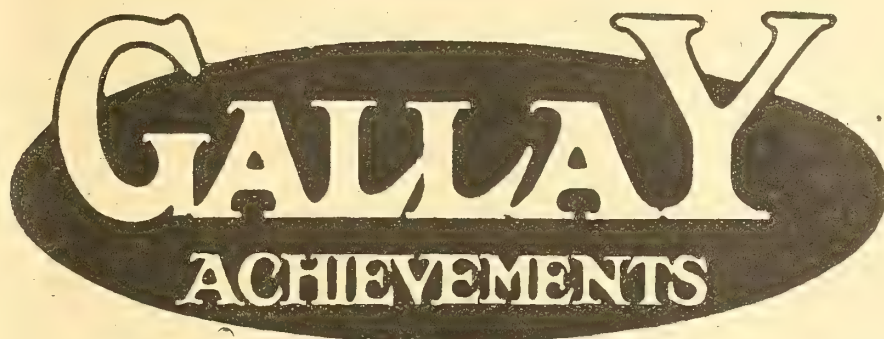
Yesterday (March 12th) a raid was made on billets and sidings at St. Pierre Capelle (east of Nieuport). Many bombs were dropped. Bursts were observed on the objectives, and a large fire started.

(Continued on page 1107.)



# WE MANUFACTURE

RADIATORS . OIL COOLERS . COWLS . TANKS  
MANIFOLDS . EXHAUST BOXES . SPINNINGS  
AND AERONAUTICAL SUPPLIES OF ALL KINDS



We have reduced the Radiator Factor to

**X**

X in this case is not an unknown quantity, but war conditions necessitate us hiding our light under a bushel—except—to Aero constructors employed on Government work.

Our latest radiator supplied to cool the famous **200 h.p.**—engine, weighs only **21 lbs.**, half the usual weight.

This is a commercial proposition and not an experiment. It is produced in large quantities and is the strongest, lightest, and most serviceable radiator yet produced.

**WE DELIVER TO AIR COUNCIL ALLOCATION**

Our designers and experience are  
always at our customers' disposal.

**GALLAY RADIATOR CO., LTD.,**

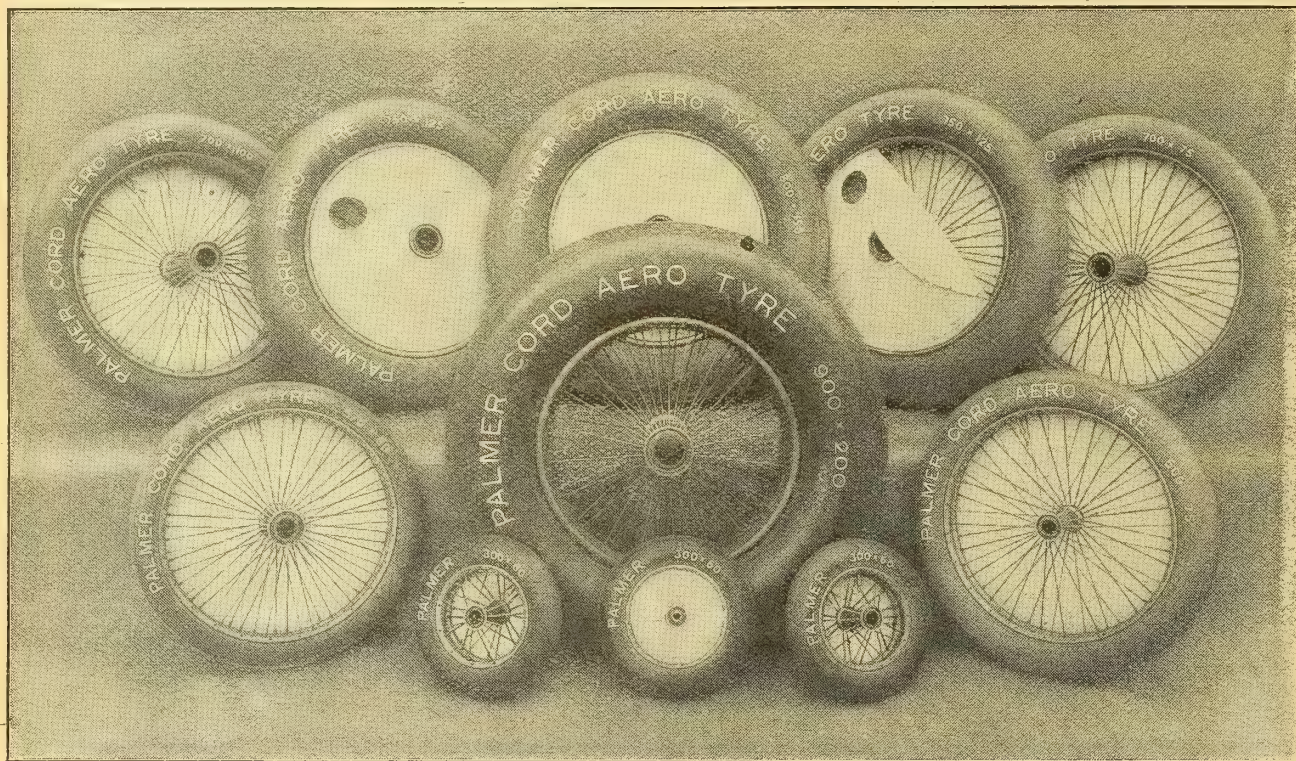
**198, Great Portland Street, London, W.1.**





# PALMER

## LANDING WHEELS & TYRES



### STANDARD SIZES :

Tyre Sizes	Wheel No.	Hub		Track Line	Tyre Sizes	Wheel No.	Hub		Track Line	Tyre Sizes	Wheel No.	Hub		Track Line
		Length	Bore				Length	Bore				Length	Bore	
300x60	16	m/m 111.12	m/m 25.4	Central	700x75	100	m/m 178.	m/m 38.09	132/46	800x150	82	m/m 185.	m/m 55.	135/50
"	17	72.39	12.7	Central	"	101	178.	31.75	132/46	"	85	185.	55.	Central
450x60	30	89.	31.75	Central	700x100	92	185.	55.	135/50	"	+36	185.	55.	135/50
575x60	111	150.	38.09	104/46	"	95	185.	55.	Central	"	+40	185.	60.32	135/50
"	21	160.	28.	Central	"	77	178.	44.45	132/46	900x200	39	185.	55.	Central
"	34	150.	31.75	104/46	"	93	150.	40.	Central	"	42	185.	60.32	125/60
650x65	78	178.	44.45	132/46	"	33	150.	38.09	Central	"	47	185.	55.	125/60
"	100	178.	38.09	132/46	"	99	178.	38.89	132/46	"	202	185.	60.32	Central
"	101	178.	31.75	132/46	"	96	178.	55.	132/46	"	"	"	"	"
600x75	111	150.	38.09	104/46	750x125	92	185.	55.	135/50	1000x150	97	250.	65.4	Central
"	21	160.	28.	Central	"	95	185.	55.	Central	"	102	185.	55.	125/60
"	34	150.	31.75	104/46	"	77	178.	44.45	132/46	"	201	185.	60.32	125/60
700x75	78	178.	44.45	132/46	"	93	150.	40.	Central	1100x200	52	185.	55.	116/69
"	79	178.	44.45	Central	"	33	150.	38.09	Central	"	57	185.	55.	Central
"	"	"	"	"	"	99	178.	38.89	132/46	"	203	185.	60.32	116/69
"	"	"	"	"	"	96	178.	55.	132/46	"	204	185.	60.32	Central

+Wheels Nos. 36 and 40 are of stronger type than the other wheels for 800x150 tyres.

## THE PALMER TYRE LIMITED

Contractors to the Admiralty and to the War Office,

119, 121, 123, SHAFTESBURY AVENUE, LONDON, W.C.2.

Telegrams: "TYRICORD, WESTCENT, LONDON."

Telephone: GERRARD 1214 (Five lines).

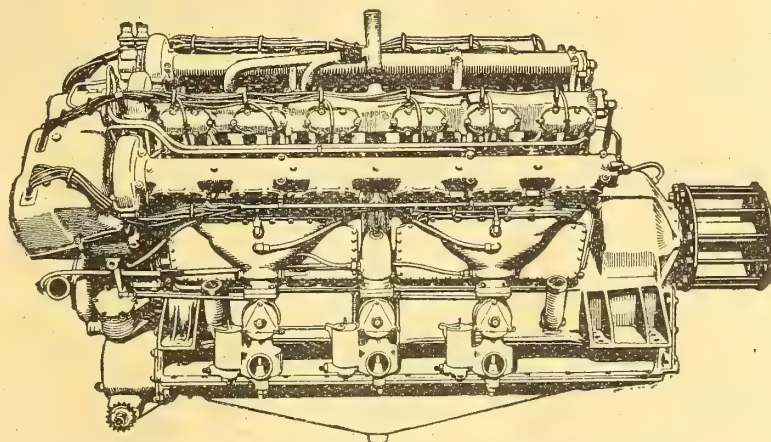
PARIS: 24, Boulevard de Villiers, Levallois-Perret.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



Original in conception, Sunbeam-Coatalen Aircraft Engines have not only retained their supremacy, but have also added to their prestige by giving service which only the finest engineering practice could make possible.

# SUNBEAM-COATALEN AIRCRAFT MOTORS



18-CYLINDER SUNBEAM-COATALEN AIRCRAFT ENGINE.



THE SUNBEAM MOTOR CAR CO., LTD.,  
WOLVERHAMPTON.



“ “ CONTRACTORS TO “ “  
HIS MAJESTY'S WAR OFFICE

*Messrs. Gordon Watney & Co. Ltd.*

**AERONAUTICAL AND  
GENERAL ENGINEERS**

South Lodge Motor Factory

**WEYBRIDGE**



Telephones WEYBRIDGE 550 (7 lines),

Telegrams: "MERCEDIS, WEYBRIDGE."



# AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER

## The British Aircraft Industry.

(SECOND SERIES.)

BY R. P. HEARNE.

### VIII.—THE BRITISH AEROPLANE VARNISH CO., LTD.

I wonder what percentage of people inside or outside the aeroplane movement have a correct estimate of the importance of dope? The makers of dope may be ruled out of court, as naturally they might be expected to think that the aeroplane itself is merely a crude structure to which dope lends its lustre and beneficent aid, and that in effect nothing really mattered much except dope!

But before going further I wish to protest against the use of the word "dope." Indeed, I might open out the matter that we are rather unfortunate in our aeronautical phraseology, and that somebody should try and reform it.

#### WHY DOPE?

The word dope merits first attention. Dope is American slang, and I believe it first came into use to describe the drugging of racehorses, pugilists, and other competitive creatures, either for the purpose of rendering them more powerful, or to crack them up. The man or the horse who carried your money was doped up to high efficiency; the rival horse or man was doped to go sleepy in the contest. This kind of thing comes from placing sport on a business basis.

One can apply the term "dope" also to the doses of ether or other "kid revivers" with which the German storm troops are treated when they are sent out to win Verdun or Calais, or some other place at which they never arrive. Thus I think that "dope" is an unsavoury word to use for "aeroplane varnish."

I suppose some philologist will be able to show me that dope is a good old Elizabethan word, which was used to describe varnish. And the inevitable gentleman who maintains that there is nothing new under the sun will advance evidence to indicate that the Chinese used the equivalent of the word dope to designate

the varnish which they put on the wings of flying machines about fifty centuries before the Christian era. [There is no evidence that the ancient Chinese aeroplanes had wings.—Ed.]

#### THE ORIGINATOR OF TITANINE.

After this dignified protest let me introduce Mr. T. W. H. Ward, of the British Aeroplane Varnish Company, Ltd., makers of Titanine Dope. Mr. Ward is one of the most forceful personages I have met in the Aircraft Industry, and he has greatly added to my interest in dope. (I must keep on using the word until we get a substitute). The title of his company also indi-

cates that dope can be called by another name and lose none of its pungency, even if a pungent wit was required to convey in one word the idea that the strength, or durability, of a Titan could be imbued into a varnish for the purpose of protecting linen fabric and "tightenin'" it at the same time.

Born in Newcastle-on-Tyne, and educated at King's College School, Mr. Ward showed at an early age his technical aptitude, and when he took up the dope problem he worked at it with characteristic energy and originality.

It is by reason of what Mr. Ward told me, and of the experiments he carried out for me, that I have been strengthened in the belief that dope is of far more importance than most people imagine. We all know that dope is but a varnish, and taking a superficial view of it we might be inclined to think that its beauty or its importance was only skin deep.

#### THE REASON FOR DOPE.

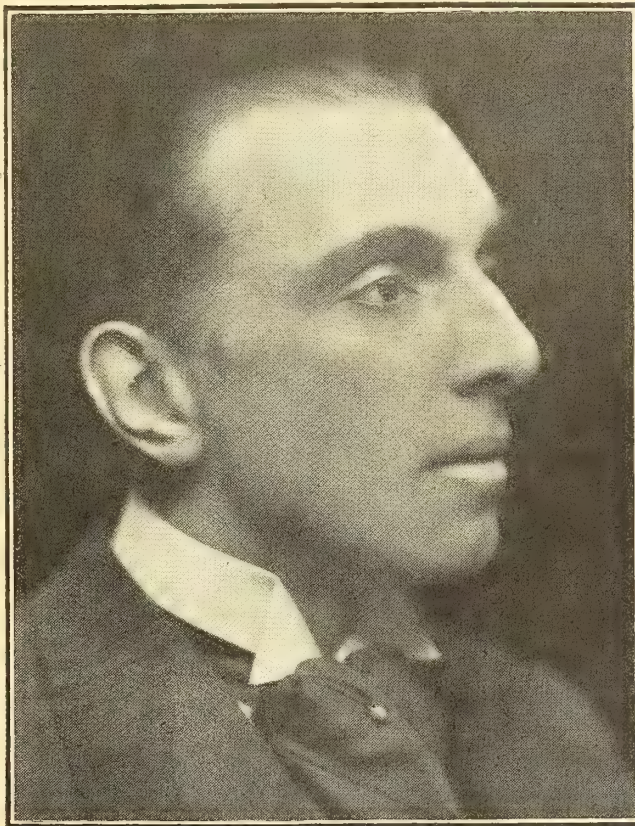
An aeroplane's fabric must have its varnished surfacing, and on this surfacing depends to a very considerable extent the weather-proofness of the machine and the tension of the fabric. Under war conditions aeroplanes must stand a great deal of hardship, and one has only to think of the modern badly starched linen collar in its most limpid form to understand how greatly subject fabrics are to climatic conditions and bad surfacing. (Happy thought—why not have our collars doped, and save starch for the racehorses, the brewers, or the War Loan billposters?)

#### POISON AND FIRE.

When it was agreed through practical experience that a special varnish was required for aeroplane surfacing two great problems soon arose. In almost every case the dopes employed were both highly poisonous and inflammable. It would be a melancholy record to trace the number of persons in Europe who owed their premature deaths

to poisonous dopes, and it took a lot to induce people to believe that poisonous dopes were not necessary to efficiency.

I believe that I am not revealing a State secret in hinting that we are largely indebted to Mr. Ward and his firm for the pioneer work which they did in helping to render dope non-poisonous. As to how they did it I cannot go into details, but the telegraphic address of the company, "Tetrafree," is a happy reference to the omission of an ingredient which was at the root of all trouble. Tetrachlorethane was an indispensable ingredient in most if not all known dopes before the advent of Titanine, and Titanine Dope is free, I am told, from that polysyllabic



Mr. T. W. H. Ward.



poison, and from all other spirit derivatives of chlorine, Titanine was invented by Mr. Ward with the aid of his friend and co-director Mr. S. E. Groves, and though Mr. Ward has had a sound chemical training, he soon devoted himself to the commercial side of the business, leaving his brother, Dr. J. G. Ward, a highly skilled chemist, and Mr. Groves to carry on the technical developments. For the business side of the firm Mr. Ward has the assistance of Mr. D. C. Hutchinson, a gentleman well known among the aircraft firms.

When this group of skilled people took up the problem of aeroplane varnish, or dope, they were able to bring great experience to bear upon the subject, and it is not surprising that Titanine Dope made its way quickly to the front rank. The mixture evolved by them was not a mere slavish imitation of other dopes. It is based on an entirely original formula which reveals a good deal of hard thinking and independent research. Many problems that have arisen from time to time have been almost immediately solved by this firm.

#### A LIFE-SAVING INVENTION.

I have referred to the two grave defects of the primitive dopes, and it has been hinted that Mr. Ward and his firm gave great help in removing the poisonous effect of the mixture on the workers who applied it. The manner in which the improvement was brought about is a curious little story, which I must not tell until the war is over.

As to the non-flammability of dope, we have achieved great progress also, and Mr. Ward has made a very deep study of the matter. He carried out for my benefit a number of highly interesting experiments, and they fully supported the theory I have long held that aircraft should be rendered practically fire-proof. The trouble eventually may not be so much with the dope as with the fabric and the wood, as both these articles are inherently inflammable, especially under the influence of a rapid and powerful igniter like petrol.

Here it is that I see coming an immensely important development in dope, for I believe that in time we shall find a surfacing which, as well as weather-proofing the wood and fabric, will fire-proof it entirely. The necessity for this development has been clear long before the war to everyone in the aircraft movement, and the war has brought out yet more strongly the importance of reducing the fire risk.

That the Germans are studying this problem as closely as we are goes without saying, but I think that on the whole we are ahead of them, not so much, perhaps, from the use of a better surfacing as from the more careful detail work we put into the fitting and equipment of our machines.

#### AN EYE TO THE FUTURE.

Very many difficulties have yet to be overcome ere the ideal

stage is reached, and it is well for us that we have men like Mr. Ward concentrating on certain aspects of the affair. The full importance of the development will be more apparent in peace time than in war time. After all, the fighting aeroplane runs many risks greater than that of fire, and war pilots take them all in the day's work. All the same, we should spare no effort to reduce their risks. But with large commercial machines it will be most essential to establish public confidence right away. If the "Stunt Press" circulates the idea that air liners catch fire easily we shall find a public reluctance to travelling by the way of the air, and even the circular-sending industry will be afraid to trust their precious sales catalogues to the aerial post. In Parliament we may find the accredited representative of some rusty railway or water-crested canal demanding the suppression of these dangerous aircraft in the public interest, and so a campaign of prejudice may be created which may be hard to fight down.

#### CONTINENTAL PROGRESS.

All this has to do with the matter of dope, and Mr. Ward is a far-seeing man who looks forward to the uprise of great commercial air fleets after the war. He is very sanguine that a high degree of safety against fire can be given to aircraft, and he fully grasps the importance of this from the public standpoint. He and his firm have been working with great energy to improve things in this respect, and the dopes of to-day mark a signal improvement over those of a few years back. From the experiments which Mr. Ward showed me I had a graphic proof of this fact.

It would be superfluous to say that Mr. Ward is a very keen enthusiast in all that pertains to aircraft and aerial navigation, and beyond all doubt he is an exceedingly valuable man to the movement. As well as specialising in a highly important branch of the industry, he takes a wide view of the situation as a whole, and he is not afraid of looking into the future. It is a comforting thing to know that in the British aircraft movement to-day we have no lack of bold thinkers and progressive workers, who, if they are given fair play, will keep our industry ahead of all rivals.

The British Aeroplane Varnish Company has several factories in this country, and they are opening works in America also. To each factory is attached a well-equipped laboratory, and it is the proud claim of this firm that they have the finest technical organisation in the world for this class of work. I set forth their claim "without prejudice," as the lawyers say, merely asking the other dope makers to direct their attacks against Mr. Ward and not against me. I shall be very pleased to give every other firm a fair field and no favour, and the hotter the battle of the dopes will be the more we shall enjoy it. But for Heaven's sake keep out poisonous gases and inflammatory phrases.

### EDUCATIONAL LECTURES.

A series of ten educational lectures on Aeronautics have been arranged under the auspices of the Aeronautical Society of Great Britain, to be given in St. Peter's Hall, Cricklewood Lane, N.W., by the authority of and with the approval of the Air Ministry.

These lectures will be illustrated when necessary by lantern slides and models, and will begin at 7.30 p.m. on the dates given below:—

No. I. Thursday, March 7th, by Capt. F. M. Green, A.M.I.C.E.: History and Development of the Aeroplane, giving the historical milestones in the evolution of the Aeroplane and the introduction to the first principle of flight.

No. II. Thursday, March 14th, by E. F. Relf, A.R.C.Sc. (of the National Physical Laboratory): The Aerofoil and Fluid Flow Round Bodies, etc. The behaviour of flat and cambered planes, lift, drag, and efficiency.

No. III. Thursday, March 21st, by A. Fage, A.F.Ae.S. (of the National Physical Laboratory): The Airscrew. Theory and practice of the propulsion of Aircraft.

No. IV. Thursday, March 28th, by F. H. Bramwell, A.F.Ae.S.: The Modern Aeroplane. Giving the types and their performances, and probable lines of development.

No. V. Thursday, April 4th, by J. D. North, A.F.Ae.S.: Materials and Methods of Design and Construction of Aeroplanes.

No. VI. Thursday, April 11th, by Commander W. Lockwood Marsh, R.N.V.R., A.F.Ae.S.: History and Development of Balloons and Airships, as in the case of the Aeroplane.

No. VII. Thursday, April 18th, by Wing-Commander J. N. Fletcher, R.N.A.S., A.F.Ae.S.: Constructional Materials, Methods and uses of Modern Airships, Kite Balloons and Free Balloons.

No. VIII. Thursday, April 25th, by Captain Aston, R.F.C.: Stability and Control. Giving illustrations of stable and unstable types, explaining methods of calculation, etc., and effect of evolutions in the air.

No. IX. Thursday, May 2nd, by Captain J. S. Irving, R.F.C., A.F.Ae.S.: Aero-Engines. Theory and practice (standard types illustrated).

No. X. Thursday, May 9th, by Prof. W. G. Duffield, F.R.S.: Meteorology and Navigation. Giving the meteorological conditions which affect aircraft and explaining the various instruments which are used to facilitate navigation.

Cards which will admit to the whole course may be obtained from H. Handford, Esq., c/o Handley Page, Ltd., Cricklewood Lane, N.W., or from the Secretary, the Aeronautical Society of Great Britain, 7, Albemarle Street, London, W.1.

### ITALIAN INDUSTRIAL NOTES.

Two interesting facts are announced this week here. A new bronze alloy for engine-bearings has been discovered by the Lombi foundry at Intra, on Lake Maggiore. It is as workable as iron, and is said to have a resistance of from 70 to 80 kilograms to the two millimetres, and to save as much as 90 per cent. of tooling. It is, one of the papers say, suitable for turn-buckles, and, of course, is to be patented all over the world. Congratulations!

The other matter is another fast machine from a Turin firm. Their pilot, Lt. De Bernardi, who did the Turin-Rome postal flight in the early part of last year, has beaten all the firm's calculations on it, the engine having, it is said, been induced to super-engine itself on the occasion.

The High Commissary's efforts to standardise things—see his Paris utterances—have for some time been (in anticipation of the evident need of such a line of development during the present critical period) in full blast at one factory much in the front of the trade.

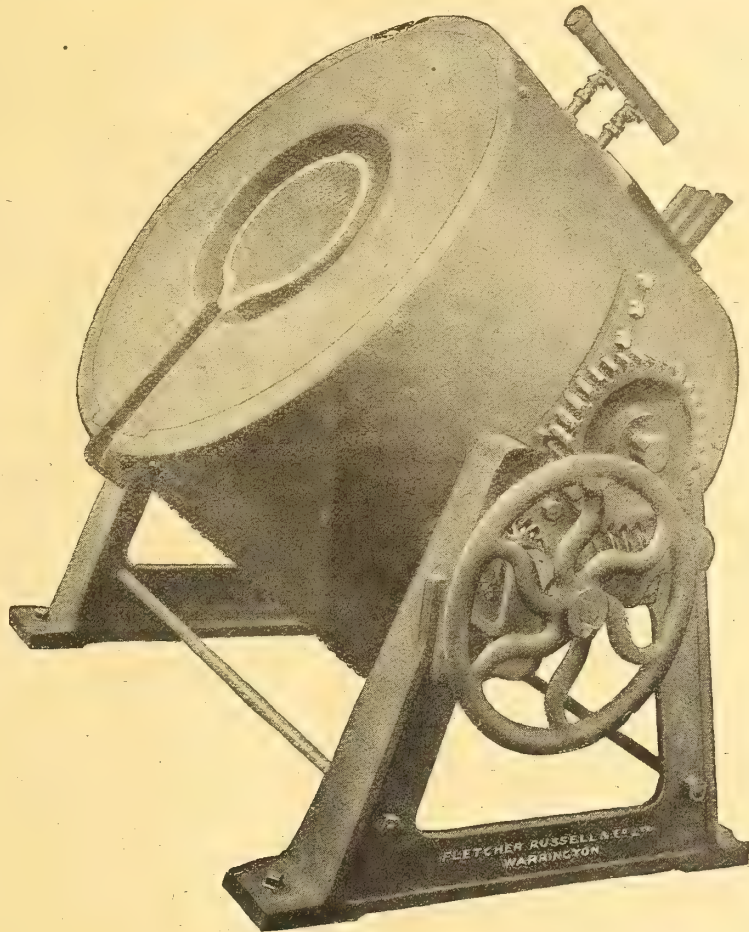
I mean the S.V.A. builders, who fit the same motors and nearly everything except lifting surface, to both the types on which they are now engaged.—T. S. H.



# Patent Cyclone Crucible Furnace

FOR USE WITH LOW PRESSURE GAS  
— AND AIR UNDER PRESSURE. —

**For Melting BRASS, GUN METAL, COPPER,**



N 5732

**And all kinds of Hard Metal  
up to Melting Point of Nickel.**

**FLETCHER, RUSSELL & Co., Ltd.,**  
PALATINE WORKS, :: CENTRAL ROAD,  
**WARRINGTON.**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



## Co-operative Research.

THE MEANS OF ORGANISING AND FINANCING AERONAUTICAL RESEARCH, AND THE ADVANTAGES LIKELY TO ACCRUE TO THE AIRCRAFT INDUSTRY FROM CO-OPERATIVE ACTION.

BY "DIOGENES."

### IV.—THE WORK TO BE DONE.

It is impossible to indicate with any exactness the work which will be undertaken by a Research Association until various preliminaries have been completed. To begin with, we must certainly know approximately how much money is to be available for expenditure. Without this information it is impossible to say what can be undertaken.

The next point is to ascertain just how far existing knowledge will really fill our needs without fresh expenditure. Here we have probably the proper field for our earliest efforts. Just as one of the great difficulties of the inventor is to find out exactly what has already been accomplished along the lines of the invention he is developing, so one of the difficulties of the Research Association will be to avoid waste of time and money on a mere duplication or corroboration of information that is already available.

#### WARNINGS ON RESEARCH.

Possible researches in connection with aircraft and their engines might cover a very wide field. There is, for example, much to be done in the way of investigating the properties of materials and determining exactly the best constitution of steels and alloys for certain specific purposes. Many other branches of the engineering industry will be engaged on very similar research in their own interests.

A great deal of work has already been done, and it would be absurd to start a research of this kind without comparing notes with other research associations likely to be similarly engaged, and without carefully co-ordinating all the results of investigations already completed. It has been said that the best designing engineer is a man who uses his memory, mainly, not for storing facts, but as a sort of index for reference.

Such a man, when he wants to know something, depends upon his memory only in so far as it will tell him where the required information is to be found. At least one well-known teacher of engineering has advocated that students should be allowed to take into examinations as many text-books as they liked.

The purely inventive or scientific brain delights in obtaining results without much regard for whether these results are going to be useful or not. Consequently, one of the most important checks that the practical and the commercial man can put upon the scientist in this matter of research is to make quite sure that the scientist does not get busy at some problem of absorbing interest when the answer to the problem could be obtained by reference to the right book or paper.

#### AN OBVIOUS OBJECTION.

Obviously we cannot just at present set about the equipment of a big new research laboratory. We cannot get the men to build it nor the machinery to put into it. This is the principal argument of those who would like to see the whole question of research shelved until the war is over.

The point is, however, that if we cannot start our work of investigation right away, it is really a good thing because there is a great deal we ought to do before we begin that work at all. Although the Aircraft Industry is a young one, a great many important investigations in connection with it have already been conducted by firms and by individuals. The results of all these must be collected and so indexed that it is possible to refer to them readily.

We also want to know what has been done in other branches of engineering. The aero engine may be a very different thing from the motor-car engine, and still more from the Diesel engine, and yet it is highly probable that the investigation into either of the latter might in many points be very valuable to the designer of the former. It would be stupid to refuse to make use of such information because some other industry had been instrumental in gathering it.

#### A BUREAU OF INFORMATION.

It would seem, then, that the first object is to establish a bureau of information in which all technical literature connected with aircraft and aero engines shall be collected, and when necessary translated. The bureau should be in close touch with the libraries in all parts of the country that are possessed of technical works.

When the Research Association comes to the conclusion that some particular subject ought to be investigated, it should be possible for the Director of Research to prepare at short notice, in conjunction with a Director of the Bureau of Information, a

concise but complete statement indicating just what overlapping work has already been done and consequently what sections of the proposed investigation are superfluous, at any rate until a later stage is reached. Moreover, the Bureau should be such that any members of the Industry can come to it with technical questions and have those questions answered as fully as is possible in the existing light of knowledge.

It would also be an excellent thing if, through the instrumentality of the Bureau, designers could borrow papers or books required for careful study of specific problems. In all this business of research, the practical man will be quite largely in the hands of the theorist and the scientist. He knows the weak as well as the strong points of the type, and he must safeguard himself against letting the investigator run loose at his expense, and waste money in solving afresh problems that are already solved.

Without a properly organised Bureau of Information he will possess no such safeguard. With it he can hold the officials of his Research Association personally responsible if at any time it is found that they are merely duplicating old results. On the other hand, some of the results already obtained and generally accepted may be unreliable. This point can only be settled if all the literature bearing upon them is available for study, so that we may see just by what means they were secured and judge whether those means are likely to have been accurate.

#### THE LABORATORY QUESTION.

There is, then, plenty of scope for work that can be begun as soon as the money is there for carrying it on. Later on we shall have to consider whether the bulk of the practical work is to be done in a laboratory of our own or with the assistance of existing institutions.

If the former, then a site must be selected and plans for building and plant prepared, so that there need be no delay when it becomes possible to get along. Next, we can at least review the field of research and try to devise a sort of system of cross reference with other sections of industry.

Doubtless, each individual industry will want to have its individual research association. This would probably be the best plan, provided always that proper co-ordination exists.

#### CO-ORDINATION.

In our case it is not merely a matter of co-ordinating our work for other parts of the engineering industry. We may wish to carry out investigations into the qualities of certain classes of timber and of certain fabrics, also into the preparation and use of paints and varnishes.

The Textile Industry has already gone a long way towards forming a Research Association. The study of fabrics, specially interesting to us, would probably be undertaken by the Association of Textile Industries with the assistance of a grant from the Aircraft Research Association.

In other cases it might be necessary ourselves to undertake the whole of the work from start to finish. In others, again, we could share expenses between a number of industries. However much money we may collect, it will not be too much, and we can afford to waste none of it.

If we wait until we are actually free to begin all the sections of our work, the resulting scramble is certain to lead to waste, and it is for this reason that it is highly desirable to go steadily ahead from now onwards, to get guarantees of financial support, and to start at the earliest possible moment upon the collection of information and the co-ordination of a general scheme of researches from which the most urgent investigations can subsequently be selected for first attention.

### TO INCREASE OUTPUT.

The Editor of THE AEROPLANE happens to know at the present moment of several really useful engineers who are on the look-out for responsible positions. One is an exceedingly able motor mechanic, good at handling men, and with considerable experience in aeroplane erection and general handling. Another is a factory organiser with several years' experience in magneto manufacture, and also in pneumatic tyre work of a special nature. He has had a good technical training, but prefers commercial organisation. Any firms who are on the look-out for good men are recommended to write to the Editor on this subject.





# CELLON

(NON-POISONOUS)

# DOPE

**CELLON LTD.,**  
**BROAD STREET HOUSE, E.C.2.**

TELEGRAMS—"AJAWB," LONDON

TELEPHONES—LONDON WALL, 5359, 3622,

**Contractors to H.M. Government.**



**THE AERONAUTICAL SOCIETY.**

On March 14th a meeting of the Aeronautical Society of Great Britain was held at the Society of Arts lecture theatre, when Mr. W. E. John delivered a lecture on Shop Organisation, a brief account of which appears hereafter. Mr. G. Holt Thomas of the Aircraft Manufacturing Co., Ltd., took the chair.

The Chairman said that the lecture was something of a new departure. Without question we had good designs in England, but the factor which still demanded study was good production.

At any rate, until the formation of the Air Board, it was impossible properly to organise a factory under conditions of perpetual alteration in design, occasional lack of orders and general official uncertainty. Now that the machinery of the Air Ministry was working smoothly the present time was most opportune for discussing the problem of shop organisation.

Mr. John said that although he would not attempt to exhaust his subject he hoped to outline a system of organisation of aircraft factories. If there was to be management there must be a manager, and it was important that he should be prepared to stand by the regulations laid down by himself. A man who was a friend of the proprietor or a shareholder in the firm was not necessarily qualified to be manager. He should be a man who could handle men as a man, and his qualities in this direction were of the utmost importance at the present time when so many men of refinement were engaged on war-work, who were very sensitive in relation to the treatment which they received from the man at the top.

The foundation of a works organisation should be the planning department, which might be sub-divided into commercial and production sections dealing respectively with costing and progress. It was essential that these departments should work harmoniously, and therefore the man at the head of the planning department should have practical experience both of costing and progress. This was all the more important in the case of aeroplane construction, where costing was such an extremely complicated thing.

The lecturer then proceeded to outline a scheme for the construction of 500 aeroplanes in batches of 50. As soon as the question of price was settled the manager should hand to the planning department an order for the execution of the contract. Each order should have a number or symbol, and each batch of 50 machines should have another number or symbol. It would be convenient if the order form were made the same size as the works time-clock cards if this system was in vogue.

The planning department should at once arrange for the preparation of the working drawings. The machines should be sectionised into different components, and each component sectionised, and the parts properly scheduled. A copy of the schedule should be sent to the order office.

It is then the duty of the order office to sort out those parts which are bought outside and to report to the planning department how things stand in this respect. The planning department then sets out orders for the making of the parts which have to be manufactured. Job cards are opened for such parts, and orders for the necessary material from stores are made out and attached to the corresponding production orders. In this connection the lecturer pointed out that it was always well to separate rough stores and departmental stores. Each job as done should be reported to the progress department to prevent it from going astray in the works.

The preparation of a progress card for each component under manufacture showing the progress of the different operations was of distinct assistance. This card should be drawn up in sections of ten small squares enclosed by rules. Then if different sections were numbered to represent the different operations on the job it was easy to show the progress of each operation by shading a number of the appropriate ten small squares with a pencil to represent the proportion of the work done. Thus if there were 200 parts of a certain type to be made and the first operation had been completed on 180 of these parts 9 squares out of ten would be shaded with a pencil.

The lecturer advocated the introduction of the simplest possible system of numbers for designating jobs and the parts thereof and he gave a rather absurd example of official failing in this respect when an order was issued to stamp the letters and figures AS/27741/CA2A on some small washers.

He advocated the decimal system of designation. That was to say, each contract should be designated by a letter, each batch of machines should be designated by a second letter, each section of the machine should be designated by a number, from one to nine, each component of that section should be represented by another number, each item in that component should be represented by a still further number, and where necessary each unit of an item could be designated by a further number.

Thus the symbol WL75522 would represent the smallest unit on an aeroplane and the other numbers and letters read from right to left would show respectively the item, component part, section of machine, batch and type to which it belonged.

In the practical use of the decimal system of designation it was wise to employ the same symbols for the same parts.

The lecturer advocated a system of coloured and numbered

clips to be attached to the cards in the files of the progress department in order that the progress of the different jobs in hand could be easily followed through the shops.

It was a good plan to have two separate boxes in which to place the job cards, and to transfer each card from the first box to the second after the beginning of each week as soon as the job was handled.

In this manner all the jobs on which progress had been made during any week were automatically transferred to the second box, and the jobs which remained stationary were left behind and ready for investigation.

For the success of the system he had outlined the co-operation of all from manager downwards was essential.

**THE DISCUSSION.**

Sir Henry Fowler was invited to open the discussion. He pointed out that there was no more difficult engineering problem than the construction in war of such a thing as an aeroplane, the details of which were changing from day to day, so that the men at the front might always have the best.

Slight alterations were a damning thing from the production standpoint, and this must be borne in mind when considering the question, and he thought that engineers were to be congratulated upon the manner in which they had tackled the problem. Alterations in details of such munitions as shells affected output, but they were nothing like so bad as alterations to small parts of aeroplanes. The decimal system of designing parts was weak when the number exceeded ten. System was certainly essential in such complicated work, but it was a matter of difficulty and of patience to train men and foremen to follow the system accurately.

Major Heckstall-Smith said that the lecturer's system differed from those most in use and he would have liked him to have gone further into the functions of the planning department. It was unusual to place the costing department under the planning department. Great skill was necessary in the selection of the department's personnel. A planning department is the works manager's brain and takes the place of the foreman in issuing instructions regarding operations, and the foreman only has to see the work through.

He did not agree with the use of small cards for watching the coming in of material or the progress of the work. He preferred a large wall diagram which hit one in the eye.

Captain Hiscocks said that it was necessary to formulate the conditions of any given work before devising a system. He thought the lecturer's system possible in a small works but considered the system of maintaining minimum stocks preferable in a large works. He thought that the lecturer's system of dividing everything into sections would upset batch ordering, because similar parts would frequently have several different numbers and confusion would result.

Mr. E. C. Gordon England said that there was a great tendency to view organisation simply as organisation, and not from the point of view of the job to be done. A system should apply either to a big or small shop so long as the job is the same. It is better to start with the product itself and produce the organisation to suit it. To get efficient production one must cut down reference numbers to the greatest possible extent. He found men had limited mental capacity and are upset by finding they have to handle one part bearing three or four different numbers. One number was easier to remember than several, it involved less likelihood of mistakes, and there was less risk of several batches of a similar part being put in hand separately, thus involving unnecessary tool setting.

It was advisable that the manager of a works should analyse the numbers of people employed who could execute the various operations in order to keep a correct balance of different parts.

Mr. Borlase Matthews said that information on costing should be more readily available in most works, as frequently costs were not produced in time to reduce expenses on the next batch of work. He advocated the use of mechanical calculators for analysing costs and determining wages, and referred to those in use at the R.A.F. [One wonders whether these have forced feed lubrication and special water-cooling arrangements.—Ed.]

He spoke well of the decimal system but asked for information as to what should be done when the number of parts exceeded nine. He mentioned the American firm which, if it finds that the price is unsatisfactory, redesigns the job to fit the price.

Mr. John in replying said that the difficulty involved when more than nine parts had to be indicated could be overcome. Incidentally he had found the decimal system useful in filing systems. The fallibility of the men in using correct figures was overcome by arranging that all the writing was done in the planning department.

The type of men required in the production department were those who had had practical workshop experience; if possible men who had served their apprenticeship. He thought that the wall chart system was too complicated to make everything visible. He did not think that the decimal system should interfere with emergency orders because the original contract should never be impeded and separate cards should be used for special jobs.



Contractors to H.M. Admiralty, War Office and Foreign Governments.

# The BRITISH CAUDRON

## CO., LTD.

SOLE BUILDING AND SELLING RIGHTS FOR

### Caudron Aeroplanes and Hydro-Aeroplanes

FOR

### THE BRITISH EMPIRE AND DEPENDENCIES

*Head Office and Works:*

**BROADWAY, CRICKLEWOOD, N.W.2.**

Cable and Telegraphic Address: "CAUDROPLAN, CRICKLE, LONDON."

Phone: 4647  
4648 HAMPSTEAD

*Scottish Factory and Aerodrome:*

**ALLOA.**

Cable and Telegraphic Address: "CAUDROPLAN, ALLOA."

Phone: 52

Telephone:—1992 HAMMERSMITH (3 lines).

# The DAVIDSON Aviation Co Ltd

**CONTRACTORS TO H.M. GOVERNMENT.**

Designers and Manufacturers of all Types  
of Aircraft for Overland and Oversea  
" " Purposes, Flying Boats, etc. " "

Managing Director:

**W. EWART CHESTER, F.R.G.S.**

Consulting Engineer:

**H. B. MOLESWORTH, M.I.C.E.**

Aviation Works & Offices - 229-231, Hammersmith Road, W.  
Engineering Works - King Street, Hammersmith,  
Airscrew Works - Ravenscourt Park, W.



KINDLY MENTION "THE AEROPLANE"

WHEN CORRESPONDING WITH ADVERTISERS.



# The "Guardian Angel" Parachutes



- Ⓐ Up to the present we have had to seek illustrations of the utility of our Parachutes by directing attention to certain casualties, where, if they had been carried available for use, fatal endings of useful careers might have been prevented.
- Ⓐ What we want to be enabled to do, is, after the introduction of our Parachutes upon the Training Grounds, to illustrate the utility of our Parachutes by the records of accidents, in which they have actually saved valuable lives.
- Ⓐ The "Guardian Angel" Parachutes have proved their utility and reliability in use with Aeroplanes, not only under all official tests, but also in actual military operations at the Front.
- Ⓐ Let the year 1918 be signalled by a great reduction of the fatal casualties upon our Training Grounds. It is quite feasible and **ALL THESE MEN ARE WANTED.**

*RELIABILITY—First.      RELIABILITY—Second.      RELIABILITY—ALL THE TIME.*

## E. R. CALTHROP'S AERIAL PATENTS, LTD.

ELDON STREET HOUSE, ELDON STREET, LONDON, E.C.2.

Tel. hons (2 lines): London Wall 3266 and 3267.

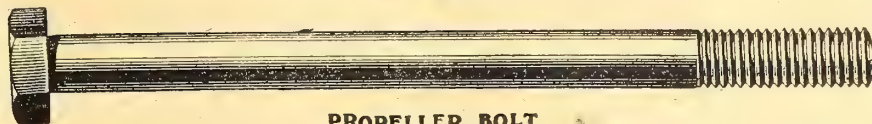
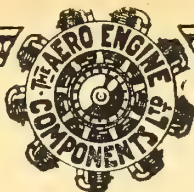
Telegraphic and Cable Address: "Savemalivo-Ave-London."

**Non-Flamm Celluloid**

GREENHILL & SONS  
8 WATER-LANE LUDGATE-HILL  
LONDON. E.C. 4

Phone Central 1306 & 1307  
Telegrams "GREENBERG" LONDON





PROPELLER BOLT

**WE** are in a position to undertake the manufacture of Propeller Bolts and all Engine Parts.

Let us hear from you.

**The Aero Engine Components Company,**  
39, ST. JAMES'S STREET, LONDON, S.W.1.  
Telephone 407 and 408 Regent.

# ALUMINIUM CASTINGS

OF EVERY DESCRIPTION.

We make a  
Speciality  
of  
Aeronautical  
and  
Automobile  
Work.

We are making many thousands of **Aluminium Die Castings** weekly under the celebrated **Cothlas** process—in many cases **entirely eliminating** machining operations, and we hold the sole manufacturing rights in the British Empire for this process.

Chemical and Physical tests are made on our own premises, and our **Castings**, both **Sand** and **Die**, are produced under the most up-to-date and scientific methods.

Sole makers of the **Birmal Aluminium Pistons**, thousands of which are running to-day in a highly satisfactory manner under the most severe conditions.

Highest  
Class  
Castings to  
Government  
Specifications.  
Prompt  
Delivery.

**BIRMINGHAM ALUMINIUM CASTING (1903) CO., LD.**  
**Cambridge Street Works, BIRMINGHAM.**



**Urgent Requirements.****MATERIAL WANTED.**

Offers required for the following:—

PLYWOOD,  $\frac{1}{16}$ "  $\frac{1}{8}$ "  $\frac{1}{4}$ "  $\frac{3}{8}$ "  $\frac{1}{2}$ "  $\frac{3}{4}$ "  $1$ "  $1\frac{1}{2}$ "

ALL TYPES OF METAL FITTINGS,

ALUMINIUM DIE CASTINGS,

and HOT BRASS STAMPINGS

for AVRO 504 J Biplanes.



**THE GRAHAME-WHITE AVIATION CO., LTD.**  
**AERONAUTICAL ENGINEERS.**

**NOTICE****To DeH. Contractors.**

We can supply *ex* STOCK  
 BLANKINGS for all Metal Parts  
 and AXLES complete.

*Special developments of the following:—*

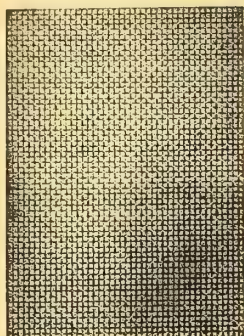
Parts Nos. 9485 } Three blankings per set.  
 " " 9488 }

Telephone:—Kingsbury 120 (5 lines).

Telegrams:—Volplane, Hyde, London.

**THE LONDON AERODROME, HENDON, N.W.9**

Proprietors of the London Aerodrome and the Grahame-White School of Flying.

**AIR BOARD STANDARD****PETROL GAUZE—** CONTROLLED BY  
THE AIR BOARD.

WOVEN WIRE CLOTH  
 IN ALL METALS AND  
 IN ALL MESHES AND STRENGTHS.

MANUFACTURED BY

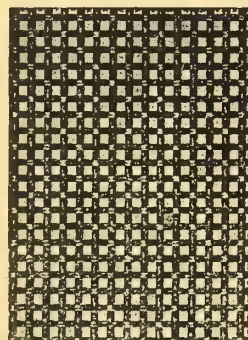
**N. GREENING & SONS, LTD.** ESTABLISHED 1799.

LONDON WAREHOUSE—

**16 FINSBURY STREET, E.C.2.**

Telegrams—"SETSCREW, FINSQUARE, LONDON."

Telephone No.—LONDON WALL 1082.

**WORKS - WARRINGTON.**



# SAMUEL MERCER & CO.,

Telegrams RECONCILED CANNON, LONDON

Proprietor—S. J. MERCER.

Telephone: CITY 6342.

## Metals

MILD STEEL SHEETS  
SPECN. S3 & 9A.

Passed & Stamped A.I.D.

BEST CHARCOAL  
TINNED & LEAD  
COATED.

BLACK C/R and C/A  
SHEETS.

GALVD. SHEETS.

## Immediate

*Manufacturers of Solder*

## for Aircraft.

BRASS AND COPPER  
SHEETS.

SOLDER. INGOTTIN.

WELDING WIRE.

COPPER BITS, ETC.

LARGE STOCKS IN OUR  
OWN WAREHOUSE.

## Deliveries.

*for all purposes.*



198, UPPER THAMES ST., LONDON, E.C.4.

# HANDLEY PAGE LTD.

CONTRACTORS TO  
THE ADMIRALTY  
AND WAR OFFICE

CRICKLEWOOD,  
LONDON, N.W.2.

HAMPSTEAD 7600 (9 lines).

"HYDROPHID, CRICKLE," LONDON





# The Aeroplane

## Acceptance and Experimental Flights—

The Procter Isaac Aviation Co. "Aeromina, Pacey, London. Gerrard 278 (2 lines).

## Acetylene Welding Plant—

Acetylene Corporation of Great Britain, Ltd., The 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830. Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3549 Victoria (3 lines).

## Aeroplane Manufacturers—

Aircraft Manufacturing Co., Ltd., Hendon. "Airmanship, Hyde, London." Kingsbury 180.

Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle-on-Tyne. "Armstrong Aviation, Newcastle-on-Tyne." Gosforth 500.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851. British & Colonial Aeroplane Co., Ltd. (The Bristol Co.), Filton, Bristol. "Aviation, Bristol." Bristol 3906.

British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudron, Cricklewood, London." Hampstead 5531.

Central Aircraft Co., Palmerston Works, High Road, Kiburn, N.W.6. "Aviduction, Phone, London." Hampstead 4403 and 4404. Davidson Aviation Co., Ltd., Hammersmith, W.6. "Hammersmith 1992 (3 lines).

Eastbourne Aviation Co., Ltd., Eastbourne. "Aircraft, Eastbourne." Eastbourne 1176. Grahame-White Aviation Co., Ltd., London Aerodrome, Hendon. "Volplane, Hyde, London." Kingsbury 120.

Handley Page, Ltd., 110, Cricklewood Lane, N.W.2. "Hydroliid, Cricklewood, London." Hampstead 7420.

Hooper & Co., Ltd., 54, St. James St. Piccadilly, London, S.W. "Sociable, St. James, London." Regent 012.

Mann, Egerton & Co., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Martinsyde, Ltd., Brooklands, Byfleet. "Martinsyde, Weybridge." Woking 331; Byfleet 171.

National Aircraft Co., Ltd., 15, Hackney Road, N.E.2. "London Wall 6725.

"Nieuport" & General Aircraft Co., Cricklewood, London, N.W.2. "Nieuport, Cricklewood, London." Willesden 2453.

Norman-Thompson Flight Co., Ltd., Bognor. "Soaring, Bognor." Bognor 48.

The Regent Carriage Co., Ltd., 126/132, New King's Road, Fulham, S.W.6. "Carbodis, London." Putney 2240-2241.

Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester." City 8530-8531, Manchester.

Saunders, S. E., Ltd., East Cowes, I.O.W. "Consuta, East Cowes." Cowes 193.

Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tested, Phone, London." Regent 378.

Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston." Kingston 744.

Standard Aircraft Manufacturing Co., Effingham House, Arundel Street, W.C.2. "Gunsgrush, Estrand, London." City 89.

Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickerfyta, Knights, London." Kensington 6810.

Waring & Gillow, Ltd., Hammersmith. "Warisen, Ox, London." Museum 5000.

Westland Aircraft Works, Yeovil. "Aircraft, Yeovil." Yeovil 129.

White, J. Samuel, & Co., Ltd., East Cowes. "White, East Cowes." Cowes 3.

Whitehead Aircraft (1917), Ltd., Richmond Surrey. "Whitecraft, Richmond, Surrey." Richmond 1865.

Wycombe Aircraft Constructors, Ltd., High Wycombe, Bucks. "Aircraft, High Wycombe." High Wycombe 84.

## Airships—

Airships, Ltd., High Street, Merton. "Short Bros., Rochester, Eastchurch, and Whitehall House, S.W." "Tested, Phone, London." Regent 478.

## Aluminium Castings (Sand & Die)

Coan, R. W., 219, Goswell Road, London, E.C.1. "Krankases, Isling, London." City 1846.

## Bearings (Etonia Cast Phosphor Bronze)—

Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds." Central 3927.

## Brass Sheets for Tipping Propellers—

Pritt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fen, London." Avenue 995, 996, and 7006.

## Buildings—

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

Palmer, T. W., & Co., Church Road, Merton Abbey, Surrey. "Wimbledon 1313.

Rubery, Owen & Co., Darlaston, South Staffs. The Willey Co., Ltd., Salisbury House, London Wall, E.C.2. "Wrathless, Phone, London." City 2681-2.

## Cable Coverings and Cable Controls—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Capstan Work—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Carburettors—

Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.1. "Victoria 4070.

## Casein—

Nieuwhof, Surie & Co., Ltd., 5, Lloyds Avenue, London, E.C.3. "Surico don, Fen Avenue 34 and 35.

## Castings—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Castings (Aluminium, Brass, Bronze, Machined or Rough)—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Celluloid (Non-Flam.)—

Greenhill & Sons, 8, Water Lane, E.C. "Greenberg, London." Central 1306-7. London Label Co., Beekton Road, E.16. "Label, Canning, London." East 1300.

## Clothing—

Burberry's, Ltd., Haymarket S.W.1. "Regent 2165.

Dunhill's, Ltd., Euston Road, N.W.1. "Dunhill, London." North 3405-6.

## Component Parts—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines).

Central Aircraft Co., Palmerston Works, High Rd., Kiburn, N.W.6. Hampstead, 4728. "Aviduction, Phone, London."

P.D.V. Aircraft Co., Ltd., Princes Street, Richmond. "Aeros, Richmond." Richmond 1681.

The Aircraft Construction Co., Harley Works, Beckton Road, E.16. "Aeracracons, Canning, London." East 1300.

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

## Cords, Tapes, and Threads—

MacLennan, L. & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.

## Dopes—

British Aeroplane Varnish Co., Ltd., 166, Piccadilly, W.1. "Tetrafree, Pacey, London." Gerrard 2312.

British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellulata, London." Regent 4046.

The British Enamelite Co., Ltd., 30, Regent Street, S.W.1. "Ridleyren, Pacey, London." Gerrard 280.

Celion, Ltd., Broad Street House, New Broad Street, E.C.2. "Ajawb, London." London Wall 5359-3622.

Clark, Robert, Ingham & Co., Ltd., House, Bedford Street, Strand, W.C. "Pearline, Westrand." Regent 3923.

## Engines and Parts—

Allen, W. H., Son & Co., Ltd., Queen's Engineering Works, Bedford. "Pump, Bedford." Bedford No. 1.

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

The Beatty School of Flying, Ltd., The Broadway, Cricklewood, N.W.2. Hampstead 3000.

Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London." Gerrard 238.

Dudbridge Iron Works, Ltd. (Salmon), 87, Victoria Street, London S.W.1. "Aero-flight, Vic, London." Vic 7026.

Gordon Watney & Co., Ltd., Weybridge. "Mercedes, Weybridge." Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham. Richmond 1203.

Gwynnes, Ltd., Hammersmith Iron Works, Hammersmith, W. "Gwynne, Hammersmith." Hammersmith 1010.

Napier & Son, D., Ltd., 14, New Burlington Street, London, W., and at Acton, W. "Nitrifer, London." Gerrard 8926.

Robertson, J. H., & Co., 1, Albemarle Street, London, W.1. Regent 3096.

Rolls-Royce, Ltd., 14 and 15, Conduit St., W.1. "Rolthead, London." Gerrard 1654-5-6.

The Solheim Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selacero, Phone, London." Regent 1181.

Sunbeam Motor Car Co., Ltd., Wolverhampton "Moofield, Wolverhampton."

The Gnome & Le Rhône Engine Co., Ltd., 47, Victoria Street, S.W. "Elevenfold, London." Walthamstow 408 (2 lines).

## Electrical Accessories—

Belling & Co., Derby Road Works, Montague Road, Upper Edmonton, N.18. "Belling, Edmonton." Tottenham 1984.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207, London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Eus road, London." Museum 70.

Premier Electric Heaters, Ltd., 258, 259, and 360, Bradford Street, Birmingham. "Fahrenheit, Birmingham." Midland 081.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

Electric Cables— "Kalker, Coventry." Coventry 249.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207, London Wall 1564.

Electric Lighting and Power— E. Stanley Fardon, A.M.I.E.E., 67, Mosley Street, Manchester.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207, London Wall 1564.

Electro Platers and Metal Polishers' Engineers— W. Canning & Co., 133-137, Great Hampton Street, Birmingham. "Materials, Birmingham." Birmingham 3622 Central (3 lines).

Flare Lights— Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

Flexible Shafts— Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

Flying Schools— Bournemouth Aviation Co., Ltd., Talbot Village, Bournemouth. "Eiches, Winton." Bournemouth 1160.

Cambridge School of Flying and Aerodrome Co., 308, St. Andrews St., Cambridge. "Carbon, Cambridge." Cambridge 5 and 1086.

Furniture (Office)— Cooke's (Finsbury), Ltd., Finsbury Pavement House, London, E.C.2. London Wall 573 and 6179.

Galvanising— Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

The Rustless Iron (Cowper Coles Process), Ltd., 1, French St., Sunbury-on-Thames, Middlesex. Sunbury 37.

Gears— Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham." East 407.

Glue— Central Chemicals, Ltd., 283, West End Lane, London, N.W.6. "Entramical, Westham, London." Improved Liquid Glues Co., Ltd., Gt. Hermitage Street, E. (Croid.). "Excroiden, Wapp, London." Avenue 3178.

Mendine Co., 8, Arthur Street, E.C. Bank 5873. Oldroyd, Wm., & Sons, Ltd., 9, Mincing Lane, E.C.3.

Goggles— Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Pacey, London." Regent 1340.

Gauges— J. A. Prestwich & Co., Northumberland Park, Tottenham, N.17.

Heating and Ventilating— Chas. P. Kinnell & Co., Ltd., 65 & 65a Southwark Street, London, S.E.1. "Kinnell, London." Hop 372 (2 lines).

Hollow Spars— McGruer Bentwood Hollow Spar Co., Commercial Wharf, Limech, S.E. "Gabrielson, Watloo, London." Hop 718.

Robert Young's Construction Co., Ltd., Canonbury Works, Canonbury Street, Essex Rd., London, N.1.

Instruments— British Wright Co., Ltd., 33, Chancery Lane, W.C.2. Holborn 1308.

Instruments (Scientific, Altimeters, etc.)— The Cambridge Scientific Instrument Co., Ltd., Cambridge. "Instrument, Cambridge." Cambridge 642.

Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, Phone, London." Walthamstow 180.



# WHITEHEAD AIRCRAFT LTD. and PROGRESS

## PAST, PRESENT AND FUTURE OF A GREAT FIRM.

Personality plays a great part in the accomplishment of great national objectives. No matter what forces you may have at your command, there are times when the spirit weakens, the will and the energy are used up for the time being, and something is required to stimulate them to further action.

Nor is it less true that not infrequently you may have the best materials lying in your midst and lose them for the want of direction or distribution. Many a cause has been lost for want of a leader.

In aircraft construction we owe a great deal to these men who saw what we were face to face with at the commencement of the war, and who, taking the problem of aerial warfare upon their own shoulders, started to prepare for what the uninitiated thought would never happen. The triumph to-day is to men like Mr. J. A. Whitehead, who from small beginnings has built up one of the most successful aircraft factories in the world, and who has now received Treasury sanction to increase the capital of Whitehead Aircraft, Ltd., to One Million pounds.

There are many places that were a couple of years ago muddy fields of waste ground which are now covered with buildings working day and night shifts on munitions of war, and the men who have got going and kept running in the face of unparalleled difficulties are men of business. These are the men—the workers, the organisers, the men who get things done—which the war has discovered, or, at least, given their opportunity, and they will be able to render assistance in the commercial world after the war as they have done to the military authorities during the war.

And such a man is Mr. J. A. Whitehead, the promoter of the firm of miracle and romance.

Mr. Whitehead came to England at the beginning of the war from the United States, where he had been engaged in the timber trade. He meant to do war work, but he is not the sort of man who would worry the authorities for a job, or cast about for an opening. He found his own opening and made his own job, and time has been abundantly sufficient to justify his foresight.

In a certain part of the country there is a good-sized drill hall. The transformation of this drill hall into the aircraft factory is one of the many surprising examples of grit and organising capacity which the war has brought to light. It is the work of Mr. J. A. Whitehead, who has brought to the task just the qualities that are needed. The first of them is a profound belief in the future of the aeroplane; the next, a great and infinite capacity for hard work; further, a genius for organisation and a temperament that will brook no failure.

Mr. Whitehead took over the drill hall and commenced operations. That is very easily said, but it is not at all easily done. To the uninitiated an aeroplane does not look such a very complicated structure, but to appreciate the delicate and beautiful work which goes

to make it, one must see an aeroplane stripped of its fabric—skinned, as it were—and the skeleton laid bare. The structure beneath the fabric is certainly one of the most wonderful and beautiful that is to be found in any modern engineering production. A single rib of a plane is an exquisite piece of cabinet-making; strips of faultless timber nearly 18 feet long are hollowed out with mathematical accuracy to obtain the maximum strength with the minimum weight; the sewing that keeps the fabric in place is stitchery as fine as in a lady's dress. Much of it is done by hand labour, much more by machinery, but the machinery used in making an aeroplane is very far from being fool-proof; it must be run by labour as skilled



as that which does the purely hand-work.

This was the particular sort of war work that Mr. Whitehead had in mind when he painted up the name of the company on the door of the empty drill hall. He intended to undertake Government contracts of the most exacting order, which must be closely scrutinised in every detail by Government inspectors who know their work and the standard of excellence to be achieved as not all inspectors do. Four months after the drill hall was taken over the Whitehead Company turned out its first complete machine, and when the first was completed it meant that others would follow fast. Such a feat as that could only be achieved by a



man with special qualities. Mr. Whitehead obviously has them. Technical knowledge, of course, comes first; aeroplane building is no amateur's job. Soundness of material is one of the first considerations, and there Mr. Whitehead's experience of the timber trade stood him in good stead. Then he is a first-class handler of men. That is one of the most important factors where good work and a large output is the great consideration. Discipline in work and the friendliest relations out of it are what Mr. Whitehead aims at. He expects that the men shall do their best; he impresses upon them that his good and the good of the firm are their good, but he takes care that the conditions of work are irreproachable and that the men are in every respect comfortable. More than that, a concert or a dinner now and again give him an opportunity to meet his men on friendly terms. Just as it is possible to tell a happy ship as soon as you go on board, it is possible to tell a happy engineering shop, and the Whitehead aircraft factory gives the best impression in that respect.

The factories hum with life and vigour, and from early morning goes on the work of constructing the machines which are so vital to the supremacy of the race.

Smart women workers in overalls stand at the benches welding the parts together or performing the delicate work of the wings, which, by the way, is one of the wonders of the work of dealing with the difficulties which arose in the industrial world at the beginning of the war. When the male workers trooped from the factories to take their place in the fighting line, none would have dreamed that the womanhood of the race could have stepped into the breach so nobly; but here they are, alert, active, and successful, the problem solved and the future past all doubt. In the other parts of the factory more workers are engaged on the different parts of the machines, which, when they are completed, are taken to the aerodrome to be tested in the air before they are handed over to the men who are to use them in battle.

Only those who had a great belief in the future of aviation would dream of tackling such a scheme, and the time has now come when a review of the present position and the future might be made.

Our position to-day, and no one will deny it, is that we hold the supremacy of the air over the battle fronts. To firms like Whitehead Aircraft, Ltd., who foresaw our needs, we owe that position, and to such firms we will depend on what in greater pride we will be able to write down as accomplished.

Our programme of aeroplane building must go steadily on, and there must be no resting from our labours even in the moment of success.

Whitehead Aircraft, Ltd., recognise this, and they are now giving the public a chance to co-operate with them in a great effort to make the aircraft industry the industry of this country. Aeroplane building for the purposes of warfare and for the future must be the one idea of everyone who wants his or her country to be supreme.

At the front the issues of battle will go to the side which has the largest number of scouting and battle

planes. In this, everyone will recognise what is simply a mathematical fact. If our fleet at sea were smaller than the Allied fleets of Austria and Germany, our traditions would not keep the Hun in the Kiel Canal, and if by wastage or slackening of effort the aerial fleets were allowed to dwindle, the effort which the German is now making in his factories and behind the lines to construct aeroplanes he would have an advantage which would prolong the struggle, and increase our difficulties in the work we intend to do after the war.

But, of course, there will be no slackening of effort, for the public have come to see that by all the driving force at their command they must make a colossal effort with the needs of time.

Great as are such factories as Whitehead Aircraft, Ltd., they must become still vaster, and improving the policy of making two blades of grass grow where only one grew before, we must construct Armadas where fleets grew yesterday.

The public can do what they like and whenever they like with big problems which affect them. This has always been the view of Mr. Whitehead.

Because of his experience in the rapid production of aircraft, Mr. Whitehead's views as to combating the air raids on London have been sought by many journalists. While some people blame the Government, Mr. Whitehead, as is characteristic of the man, takes his own view and expresses it with determination. "It is," he says, "no use to blame the Government or its officials. It is for the public to get behind the industry. For every enemy aeroplane that comes over London we want seven of ours to meet it. We want to stop them from coming at all, and if we bomb Germany we must send huge squadrons. The way to obtain superiority is to build more factories, to build more machines, and it is for the public to get behind the industry and help it."

This fact Mr. Whitehead is never tired of impressing; it is a fact of which the public is now, more than ever, realising the truth and force.

The stream from the factories must be never ending, for besides the work at the front we must think of the conquest of Germany.

The Gothas must be fought in their lairs, and the people of Germany made to pay the price of sending them. They have laughed to think that their homes are safe from the bombs of our airmen, but they must laugh no longer. Call for reprisals if you will, but what is aimed at is a system of defence of our own homes, our women and children, and we must go on with the work of providing the machines to carry out the system. These machines cannot be taken from the front, and they need not be if the people of Britain come forward, as they will, to do their share in aeroplane building.

As a profession, the cult of flying now ranks with the best of the older vocations, and has enthusiastically attracted the cream of our Public School and University men, as well as those qualified by mechanical training to develop into capable engineers. It is a profession for the young, and should be adopted immediately a student has finished his academical career. It offers attractions



not possessed by any other calling, and its emoluments are substantial and increasing.

Most of the large corporations engaged in the industry, and certainly all those boasting an aerodrome, have a School of Aviation attached to them, and in this relation the Whitehead School ranks among the best. It is a pet hobby of Mr. J. A. Whitehead, who takes a personal interest in the tuition and success of his pupils. The curriculum introduced by him is a most comprehensive one, and one which, if absorbed by the pupil, will assuredly create him an expert.

At this school the pupils will not only be taught the control of the finished machine, but will receive a complete initiation into the mysteries of its manufacture. There should be no need to point out the advantages of such a course of training. Nerve and pluck are essential to the aviator, but they must be reinforced with knowledge. Nowhere can such knowledge be acquired more

ment, but our battle and scouting fleets will swoop through the heavens, policing the air as our cruisers and dreadnoughts guard the ocean. An array of young airmen will be ever in course of training, and the work of constructing machines for them will keep an army of workers always employed. And in the second place there will be the possibilities of sport, travel, and commercial enterprise to gauge and to meet.

To-morrow will be the era of aerial liners, both for passengers and cargo service. Capable of carrying huge weights and remaining in the air for days, they will lead us into realms and enterprises which will increase the glory of the race and lead us on from fresh triumph to triumph.

We of the present generation will see these triumphs, though we may not hope to be the bird men and women. We live on the fringe of the changing era, but our glory shall be no less if by the efforts we make we can keep



effectively than in the workshop where the machine is built. In the Whitehead Aviation School the pupil can commence in the drawing office and become acquainted with the designs and the principles governing them. He passes hence to detail constructional work, making practical acquaintance with every part, and onward to the assembling shops where the parts are built into the machine. Finally he will pass into the aerodrome, where the pilot in charge of flights teaches him the control of the machine in the air. The works are second to none in the country, and the aerodrome unsurpassable, so that the very best possible conditions for acquiring the necessary knowledge are assured.

So much for the present and the immediate future; now to consider the greater future, the gates of which are just opening before us.

We do not need the prevision of men like Jules Verne, H. G. Wells, and other imaginative men to enable us to see what the sky will be like in other years. First of all, the end of the war will not bring aerial disarmament,

the supremacy of the skies for those who are to follow when we pass.

The year 1914 was the year of the Marne; 1915 was the year of Italy's entry into the war; 1916 was the year of Verdun; 1917 was the year of British effort on the field. The year 1918 must be the year of aviation.

Many things must be sacrificed to the new industry, so that the foundations must be built for the war that will follow the war. The industry must be British throughout. We must have an unlimited supply of material for the building of aeroplanes. Colonies like that of Whitehead Aircraft, Ltd., must be turned into communities. Factories, benches, workshops must have no idle moments, and the genius of organisation must be strengthened. Aircraft is not yet out of its infancy. An invention of to-morrow may make the new aeroplanes more reliable and unlike the first ungainly motor-car.

The realms of science and discovery must be probed deep for these inventions. The nation which discovers



the best will be the nation which will keep its possession of the new industry, which will be able to keep the largest factories going and to employ the greatest number of workmen. Also, it will be the nation which will be able to win the commercial wars of the future, because it will be able to carry its cargoes at greater speed and in greater safety.

Needless to say, it is the desire of every patriotic Briton that the nation which is to achieve all these things must be our own. The effort of 1918, therefore, it cannot be too often emphasised, must be a national one. The problem of bringing us to our present state of efficiency has been left to the pioneers of private means, but such a state of matters cannot be allowed to continue.

We ourselves must take the great task on our shoulders, must control the destinies of the aircraft industry now and for all time. We must make it our united determination that on the foundations provided for us by such private firms as Whitehead Aircraft, Ltd., we will build our successes of the morrow; that no obstacles will be too great for us to overcome; that no sacrifices will be too great for us to make to achieve a national ambition. We must be the body and the brain, the sinew and muscle of the business, the workers, the organisers, the men and the women who get things done. We must think big and will big and act big; must make oppor-

tunities and grasp every point of view which will help us to leave behind us in the race for victory all competitors, who, like ourselves, will set out on the race for the dominion of the empire of the air.

The test of war has shown us that we can emerge the victors of any great task upon which we enter. We have emerged successfully from each phase of aerial warfare, and we can look forward with confidence to the work which lies waiting for us to be done. Imagination, experience, industry, determination are characteristics of the race. They have helped us to build up our glorious tradition, and they will never desert us in our journey towards the goal on which we have set our eyes.

At the Olympic games those who started first were lashed, but they who were left behind were not crowned.

We have made the start, and we have suffered the pains of the pioneer. The supremacy of the air has not been won without sacrifices, and still more must we be prepared to give of our best and our dearest until every secret is wrested from the element. And the crown we gain can be handed down, burnished and glorious, to our sons, who, as kings of the age of the air, shall add fresh lustre to the annals of the British race.

To learn how every one can help, write to Whitehead Aircraft, Ltd., Box 8000, c/o THE AEROPLANE, for particulars of the new million pound scheme.





# Buyers' Guide.



## Machine Tools—

Brewster & Co., 11, Queen Victoria Street, E.C.4. "Circumfuse, Cannon, London." City 768.

## Magneto Driving Pieces—

Herbert Terry & Sons, Ltd., Redditch "Springs, Redditch." Redditch 61.

## Magnetics—

British Thomson-Houston Co., Ltd., Lower Ford Street, Coventry. "Asteroidal, Coventry." Coventry 278.

The M.L. Magneto Syndicate, Ltd., Victoria Works, Coventry. "Corlton, Coventry." Coventry 1008-1009.

The British Lighting & Ignition Co., Ltd., 204, Tottenham Court Road, W.1. "Vicks mag, Phone, London." Museum 430.

Eriasson Manufacturing Co. (Berling Magneto), Buffalo, N.Y., U.S.A.

## Metal Manufacturers—

Clifford, Chas. & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 42-43.

## Metals in General—

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Pitt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fen, London." Avenue 1432.

Samuel Mercer & Co., 108, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

## Metal Parts and Fittings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

Aircraft Supplies Co., Ltd., Ascol House, 125, Long Acre, W.C.2. "Upcast, Rand, London." Gerard 276 (2 lines).

Arnott & Harrison, Ltd., Hythe Road, Willesden Junction. Willesden 2267.

Bayliss, Jones & Bayliss, Ltd., Wolverhampton. (Bolts and Nuts). "Bayliss, Wolverhampton." Wolverhampton 1041.

The Birmingham Guild, Ltd., 45, Gt. Charles Street, Birmingham. "Handicraft." Central 3705.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

British Metal (Kingston), Ltd., Kingston-on-Thames.

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

Lombard Rim and Tube Co., Lombard Street, Birmingham. "Lombardic, Birmingham." Midland 211 (2 lines).

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Euston, London." Museum 70.

Mountford, Fredk., Ltd., Fremo Works, Lifford, Birmingham. "Fremo, Birmingham." Kings Norton 261.

Robertson, J. H., & Co., 1, Albemarle Street, London, W.1. Regent 3006.

Rubery, Owen & Co., Darlaston South Staffs. Sankey, Joseph & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66.

The Pulvo Engineering Co., Ltd., 10, 16, Dane Street, High Holborn, London, W.C.1. "Pulvicult, Phone, London." Holborn 410.

The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsaero, Phone, London." Regent 1181.

The Aircraft Construction Co., Harley Works, Beekton Road, E.16. "Aeracracons, Canning, London." East 1300.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

Thompson Bros., Ltd., Bradley, Bilston. "Thompson Bros., Bilston." Bilston 10.

Wooler Engineering Co., Ltd., Old Oak Common Lane, Willesden Junction, N.W.10.

## Metal Shearing Tools—

Montgomery, Smith, & Co., Ltd., Tangent Works, Keynsham, near Bristol. "Ingenuity, Saltford." Keynsham 21.

## Metal Spinnings—

Arnold & Sons, Standard Works, Lawrence Road, Tottenham, N.15. "Instruments, London." Tottenham 2370-1.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Metric Bolts—

Cashmore Bros., Zota Works, Hildreth Street, Balham, S.W. Battersea 415.

Rubery Owen & Co., Darlaston, South Staffs.

## Miscellaneous—

Anderson, D., & Son, Ltd. (Roofs), Belfast. "Anderson, Belfast." Belfast 4033-4034-4035.

Bowden Wire, Ltd., Willesden Junction, "Bowirelim, Harles, London." Willesden 2400 (3 lines).

British Metal (Kingston), Ltd., Kingston-on-Thames.

Brown Bros., Ltd., Great Eastern Street, E.C.1. "Imbrowned, Bethroad, London." London Wall 6300.

Herbert Flood Co., Ltd., Chapel-en-le-Frith. "Frodobake, Birmingham." Central 793.

London Label Co., Ltd., Harley Works, Beekton Road, E.16. "Nonflamoid" Nonflammable Celluloid. "Lonlabel, Canning, London." East 1300.

MacLennan, J., & Co., 30, Newgate Street, E.C.1. and at Glasgow. Tapes, Cords and Threads. City 3115.

## Motor Cars—

Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

Mann, Egerton & Co., Ltd., 379/381, Euston Road, London, N.W.1. "Manegecar, Euston, London." Museum 70.

Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 530 (4 lin. 9).

## Nameplates and Labels—

British Metal (Kingston), Ltd., Kingston-on-Thames.

The Clegg Metal Engraving Co., Chatsworth Works, Worthing. "Clegg Worthing." Worthing.

## Observation Panels—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterless, Piccy, London." Regent 1340.

## Parachutes—

E. R. Calthrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemativo, Ave, London." London Wall 3266-3267.

## Pattern Making—

Fredk. Ward, 6, 7 and 8, Allsop Street, Upper Baker Street, W. Padd 4743.

## Piston Rings—

British Chuck & Piston Ring Co., Coventry. "Rings, Coventry." Coventry 723.

## Plating, Nickel Silver and Electro Tinning—

Arnold & Sons, Standard Works, Lawrence Road, Tottenham, N.15. "Instruments, London." Tottenham 2370-1.

## Power Presses and Dies—

Bliss, E. W., & Co., 24, Pocock Street, Blackfriars Road, London, S.E.1. "Blissdon, London." Hop 4340.

## Presswork—

Rubery Owen & Co., Darlaston, South Staffs. Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Propellers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames. "Ebora, Kingston." Kingston 672.

Integral Propeller Co., Ltd. "Avirop, Hyde, London." Hendon 9, Kingsbury 104.

Lang Propeller, Ltd., Weybridge. "Aerosticks, Weybridge." Weybridge 520-521.

Mann, Egerton & Co., Ltd., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Oddy, W. D., & Co., Leeds. "Aircscrews, Leeds." Central 291, Leeds.

Stanley Aviation Co., 67, Kingsland Road, E.2. City 8347.

Westland Aircraft Works, Yeovil. "Aircraft, Yeovil." Yeovil 120.

## Pyrometers—

The Foster Instrument Co., Leitchworth, Herts. Foster Instruments, Leitchworth, Leitchworth 26.

## Rigging for Aircraft—

Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466.

## Rubber Tubing & Accessories—

Hancock, James Lyne, Ltd., 266, Goswell Road, London, E.C.1. "Masticator, Isling, London." City 3811 and 3812.

## Safety Belts—

Holmes, C. H., & Son, 38, Albert Street, Manchester. "Semloh, Manchester." City 4432.

## Screw-driving Machines—

Russell Bros. (Redditch), Ltd., Littleworth, Redditch. "Inventors, Redditch." Redditch 74.

## Seaplane Manufacturers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

Gosport Aircraft Co., Gosport. "Flight, Gosport." Telephone No. 217.

Mann, Egerton & Co., Ltd., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

The Norman Thompson Flight Co., Ltd., Middleton, Bognor. "Soaring, Bognor." Bognor 48.

Short Bros., Rochester. "Seaplanes, Rochester." Chatham 627.

Supermarine Aviation Co., Ltd., Southampton. "Supermarine, Southampton." Southampton 1337.

## Searchlights and Landing Lights—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3340 Victoria (3 lines).

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

## Seats for Aeroplanes—

Bowser, E., Art Cane Works, 50 Park Lane, Leeds. Central 3473.

## Shackles—

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

## Sheet Metal Pressings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

Arnold & Sons, Standard Works, Lawrence Road, Tottenham, N.15. "Instruments, London." Tottenham 2370-1.

Blackburn Aeroplane and Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345.

W. H. Briscoe & Co., Ltd., 51 and 52, Park Street, Birmingham. "Brisk, Blam." Central 550.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

London Aluminium Co., Ltd., Westwood Road, Aston, Birmingham. East 497 Birmingham.

Rubery Owen & Co., Darlaston, South Staffs.

## Sheet Metal Work—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 480.

Arnold & Sons, Standard Works, Lawrence Road, Tottenham, N.15. "Instruments, London." Tottenham 2370-1.

British Metal (Kingston), Ltd., Kingston-on-Thames.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Rubery Owen & Co., Darlaston, South Staffs. The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 480.

The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsaero, Phone, London." Regent 1181.

Arthur Hill & Co., Silchester Road, North Kensington, W. Park 1443.

## Shock Absorbers (Elastic Cord)—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Sparking Plugs—

Lodge Sparking Plug Co., Ltd., Rugby. "Igniter, Rugby." Rugby 235.

Ripault, Leo, & Co., Ltd. (Oleo Plugs), 644, Poland Street, W.1. "Ripault, Reg, London." Gerrard 7758.

## Springs—

Dart Spring Co., West Bromwich. "Dart, West Bromwich." West Bromwich 322.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61 (3 lines).

## Stampings—

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Arnold & Sons, Standard Works, Lawrence Road, Tottenham, N.15. "Instruments, London." Tottenham 2370-1.

## Steel—

Firth, Thos., & Sons, Sheffield. "Firth, Sheffield." Sheffield 3230 to 3237.

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

Nicklin, Bernard, & Co., Birmingham. "Bernico, Birmingham." Smithwick 224.

## Steel Stamps and Markings—

John Meerloo & Sons, Cleveland Works, Cleveland Street, Mile End, E.1. "Dayhur, Phone, London." East 3331 (2 lines).

## Steel Tubes for Aeroplanes—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

## Taper Pins—

Mountford, Fredk. (Birmingham), Ltd., Fremo Works, Lifford, Birmingham. "Fremo, Birmingham." King's Norton 261-262.

## Tapes and Smallwares—

MacLennan, John, & Co., 30, Newgate Street, E.C.1. And at Glasgow. City 3115.

James North Hardy & Son, Ltd., 34, Portland Street, Manchester. "Hardsen, Manchester." Central 6471.

## Timber—

Engineering Timber Co., Ltd., 9, Victoria Street, London, S.W. "Entikosis, Vic, London." Victoria 3073, 4210.

Brown, R. F., & F. W., Wollaton Saw Mills, near Nottingham. "Brown's Saw Mills, Wollaton." Nottingham 1526.

J. Owen & Sons, Ltd., 109a, Borough High Street, S.E.1. "Bucheron, London." Hop 3811 (2 lines).

BUYERS' GUIDE cont. on next page.



**"The Aeroplane" Buyers' Guide.—continued.**

**Time Recorders—**

Gledhill-Brook Time Recorders, Ltd., 26, Victoria Street, S.W.1. Victoria 1310.

**Turnbuckles—**

Kubery Owen & Co., Darlaston, South Staffs.

**Tyres and Wheels—**

The Palmer Tyre, Ltd., Shaftesbury Avenue. "Tyricord, Westcent." Gerrard 1214 (5 lines)

**Undercarriages—**

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

**Varnishes—**

The British Emailite Co., Ltd., 30, Regent Street, S.W.1. "Ridleytren, Piccy, London." Gerrard 280.

Clark, R. Ingham & Co., Walter House, Bedford Street, Strand, W.C. "Pearline, Westrand." Regent 3923.

Harland, W. & Son, Merton, London, S.W.19. "Harland, Wimbledon 45." Wimbledon 45 and 1395.

Naylor Bros., Ltd., Southall, Middlesex. "Naylor, Southall." Southall 30.

**Washers—**

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Herbert Terry & Sons, Ltd Redditch. "Spirings, Redditch." Redditch 61.

**Vices—**

C. and J. Hampton, Ltd., Sheffield. "Vices, Sheffield." Attercliffe 95.

**Watchmakers and Jewellers**

(Silver Models)—  
Goldsmiths' & Silversmiths' Co., Ltd., 112, Regent Street, W.1. Gerrard 0091 (3 lines).

**Welding and Cutting Plant—**

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.  
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

**Welding Repairs—**

Arnold & Sons, Standard Works, Lawrence Road, Tottenham, N.15. "Instruments, London." Tottenham 2370-1.

Barimar, Ltd., 10, Poland Street, W.1. "Bariquamar, Reg, London." Gerrard 8173.

The New Welding Co., 26, Rosebery Avenue, London, E.C.1. "Windoneeda, Holb, London." Holborn 5252.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

**Wind Shields—**

Auster, Ltd., 133, Long Acre, W.C. "Win-flector, London." Regent 5910.

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

London Label Co., Ltd., Hadley Works, Beckton Road, E.16. "Nonflamoid" Nonin-flammable Celluloid. "Lonlabel, Canning, East 1300.

**Wire Gauze—**

N. Greening & Sons, Ltd., 16, Finsbury St., London, E.C.2. "Setacrew, Finsquare, London." London Wall 1082.

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

**Wires and Cables (Aeroplanes)—**

Bruntons, Musselburgh, Scotland. "Wiremill, Musselburgh." Musselburgh 28.

Cradock, Geo., & Co., Ltd., Wakefield, Eng-land. "Cradock, Wakefield." Wakefield 466 (3 lines).

**Wirework—**

Terry Herbert & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

**Wood Refuse Suction Gas**

**Producers—**

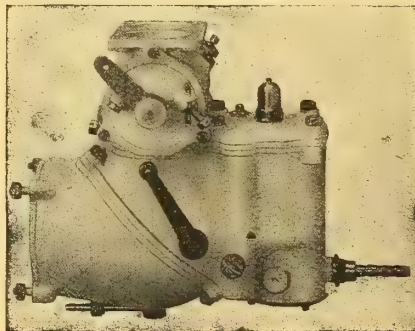
Ruston Proctor & Co., Ltd., Lincoln, England. "Ruston, Lincoln." Lincoln 580.

**Woodworking Machinery—**

Robinson, Thomas, & Son, Ltd., Railway Works, Rochdale. "Robinson, Rochdale." Rochdale 467.

Sagar, J., & Co., Ltd., Halifax. "Sawtooth, Halifax." Halifax 136.

Wadkin & Co., Leicester. "Woodworker, Leicester." Leicester 3614.



# Claudel-Hobson

## CARBURETTORS

Supplied to the Air Board  
— for Aeroplane Engines —

H. M. HOBSON, LIMITED  
59 Vauxhall Bdg. Rd., London, S.W.1

# NIEUPOORT

AND

## GENERAL AIRCRAFT COMPANY, LTD.

CONTRACTORS TO H.M. GOVERNMENT.

OFFICE AND WORKS—

LANGTON ROAD,  
CRICKLEWOOD, LONDON, N.W.2

TELEPHONE (3 LINES)—  
WILLESDEN 2455

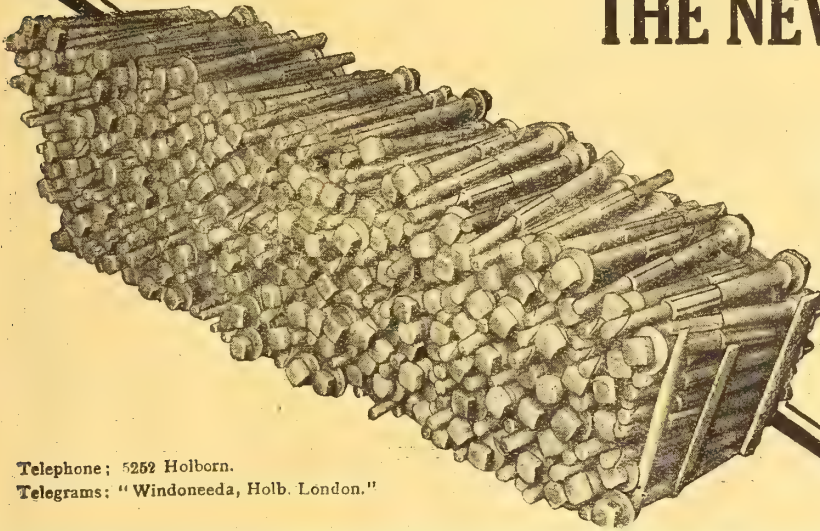
TELEGRAMS—  
NIEUSCOUT, CRICKLE, LONDON



## How 2 tons of Steel were saved from the scrap heap.

The illustration below shows six hundred sliding shafts—the square at the driving end of each had become so worn by constant hard work as to render the shafts of no further use. Not so long ago they would have been described as worn out, and new ones procured. But to-day every scrap of chrome nickel steel is required for actual munitions, and the steel for the job, which had a fairly high priority classification, could not be obtained.

## THE NEW WELDING CO.



were approached, and undertook the task of supplying the firm concerned with equivalent to six hundred new shafts, the difference being that no new steel was required and the expense was a fraction of what new shafts would have cost.

Each of the four sides of square was built up, and afterwards re-machined and case-hardened.

**THE NEW WELDING CO.,**  
26, Rosebery Avenue,  
LONDON, E.C.1.

Telephone: 5252 Holborn.  
Telegrams: "Windoneeda, Holb. London."

Telephones: DALSTON 872.

LONDON WALL 9766.

HAMPSTEAD 4768.

# Thames Aviation Works

(BURTON'S, LTD.)

**TWO COMPLETE MILL PLANTS AND TWO YEARS' EXPERIENCE.**

Addresses of our fine Saw Mills, Works, etc.,  
— have been camouflaged by the Censor. —

Offices only: 141, CURTAIN ROAD, E.C.

## CONSTRUCTORS OF COMPLETE AIRCRAFT

And all kinds of WOOD PARTS, WINGS, AILERONS,  
— STRUTS, LEVERS, RUDDERS, NACELLES, &c. —

**Specialities—BIG STUFF and BEST WORK.**



# WYCOMBE AIRCRAFT CONSTRUCTORS, LIMITED.

==  
HIGH WYCOMBE,  
BUCKS.  
==

Telephones : High Wycombe 84 (Stores : High Wycombe 120).  
Telegrams : "Aircraft, High Wycombe."

## INCREASED OUTPUT DEMANDS GREATER ACCOMMODATION

To meet calls for accelerated production The  
WILFLEY COMPANY offers its services for  
the provision of Factory Buildings of all types in  
**STEEL, FERRO-CONCRETE, BREEZE  
SLABS, ASBESTOS SHEETS, BRICK**  
and other Construction.

*DESIGNS FOR COMPLETE FACTORIES IMMEDIATELY AVAILABLE.*

TEMPORARY STRUCTURES A SPECIALITY.

**The Wilfley Company, Limited**  
**SALISBURY HOUSE, LONDON WALL, E.C. 2.**

Telegrams : "Wrathless, Phone, London."

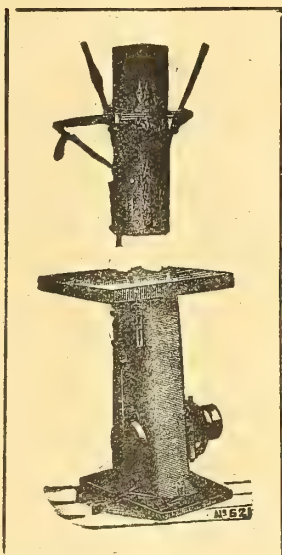
Telephones : City 2681 & 2682.





# FRET SAWING MACHINES

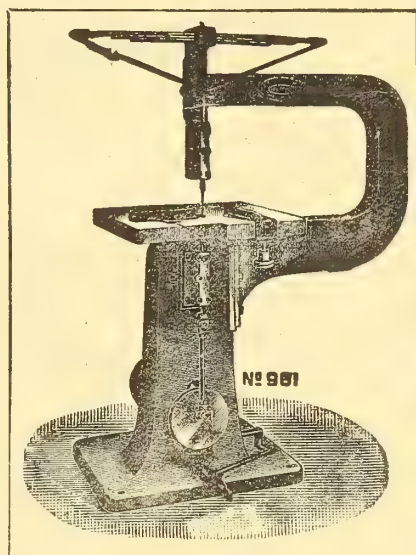
Suitable for Aircraft Work.



Made with Fixed or  
Canting Tables, and  
:: suitable Boring ::  
Apparatus if required.

Fuller particulars on  
request.

We make several other Wood  
Working Machines suitable for  
Aeroplane Builders, and shall be  
pleased to quote prices, etc., on  
receipt of enquiry.



**J. SAGAR & CO., Ltd.,** Sawmill Engineers, Canal Works, **HALIFAX, Eng.**  
LONDON OFFICE: 60, Watling Street, E.C.

The Hollow Structure and Aircraft Co., Ltd., Patent.

## WOOD PROBLEM SOLVED.

# HOLLOW SPARS

And Struts for all types of machines.

Any length, shape or section without joints.

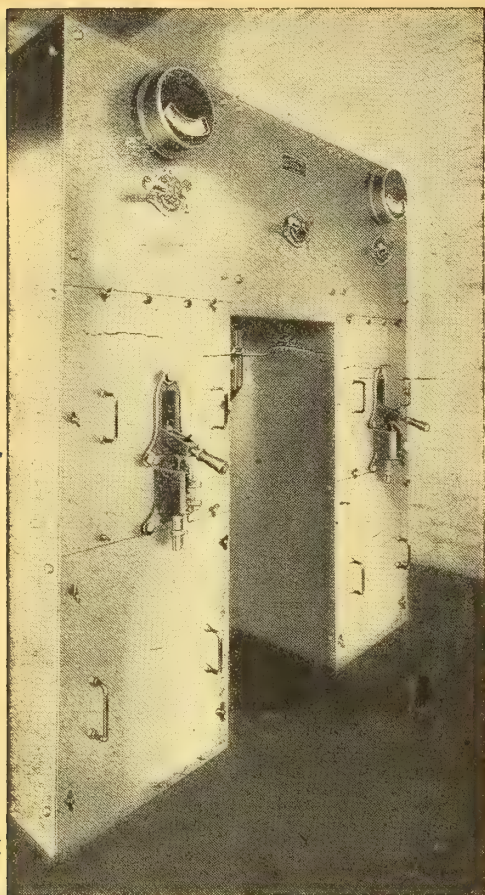
FULL PARTICULARS FROM THE SOLE LICENSEES,  
**ROBERT YOUNG'S CONSTRUCTION CO., LTD.,**  
AIRCRAFT CONTRACTORS,  
**CANONBURY WORKS, ESSEX ROAD, LONDON, N.**

TELEPHONE—  
DALSTON 2985.

TELEGRAMS—  
BYLDINCONT NORDO LONDON."

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





SPECIALISTS IN ELECTRICAL TRANSMISSION AND DISTRIBUTION



CABLES OVERHEAD LINES SWITCHGEAR TRANSFORMERS ETC

*The Illustration shows a High-tension All-Steel Totally Enclosed Front Access*

## SWITCHBOARD

*of our standard construction, lately made and erected by us to control the incoming Power Supply, at 2,200 volts, in a well-known Aeroplane Works.*

*This type is particularly suitable where space is limited.*

12, UNION COURT, OLD BROAD ST., LONDON, E. C. 2.

Telegrams  
"JUNO"  
LONDON

**JOHNSON AND PHILLIPS LTD**  
ELECTRICAL ENGINEERS & CABLE MAKERS  
**CHARLTON, LONDON, S.E. 7.**

Telephone  
400  
GREENWICH

BIRMINGHAM CARDIFF GLASGOW MANCHESTER NEWCASTLE-ON-TYNE PORTSMOUTH  
206, Corporation St. 9, Park Place. 159, W. George St. 251, Deansgate. 44b, Blackett St. Cleveland Rd. Gosport.

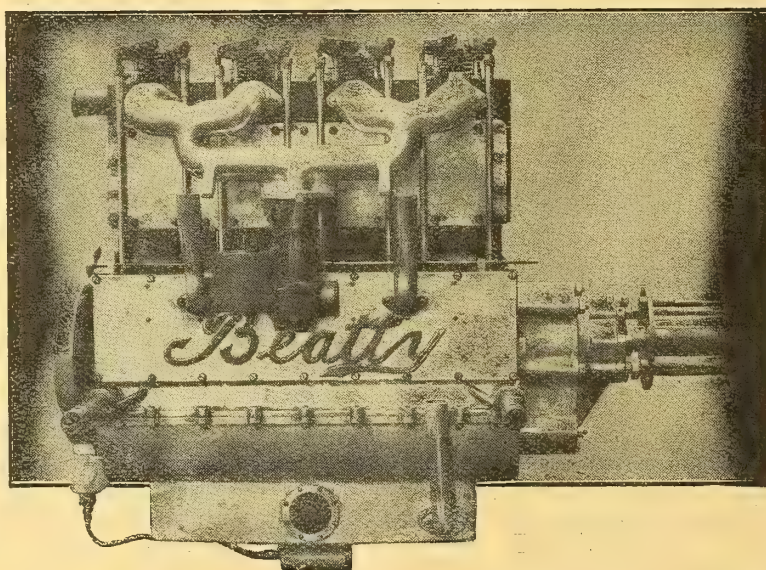
# The Beatty Monobloc Aero Engine

H.P. = 60.

R.P.M. = 1800  
Engine Shaft.

Prop. speed =  
1200 R.P.M.

Weight = 225 lbs



Petrol  
Consumption  
4.28 galls. per  
hour.

Oil  
Consumption  
.18 galls. per  
hour.

*Specially Designed and Developed for School Work.*

FULL PARTICULARS **The Beatty School of Flying Ltd.** LONDON AERODROME  
Telephone . . . Kingsbury 138.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# Press and Hot Stampings

We have a factory perfectly equipped and staffed with highly skilled workmen ready to undertake this work.

We are prepared to give advice on their production and invite your enquiries.

We can place at your disposal every facility for dealing with Press Stampings from the sheet or Hot Stampings from the bar, and before placing your orders in this direction, we ask you to consult us.

# SUCKLING

W<sup>ts</sup> SUCKLING & SONS

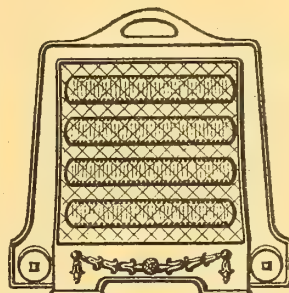
**5, KINGSWAY HOUSE,  
ALBION ST., BIRMINGHAM.**

London: Morley House, Holborn Viaduct, E.C. 1

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

## BELLING ELECTRICAL ACCESSORIES

### AIRCRAFT Manufacturing Purposes.



#### ELECTRIC FIRE.

OFFICE PATTERN. List No. 617.

An ideal fire for small offices, waiting-rooms, passages, etc. We have also supplied a large number to Aerodromes for general heating. Numerous other designs are available.

PRICE 35/-

Dimensions—Height 17½ in., Width 17½ in., Depth 5½ in.



#### ELECTRIC

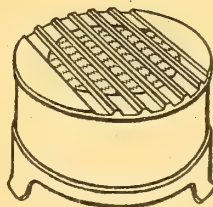
#### AIR WARMER.

List No. 960.

A reliable low temperature heating appliance, suitable for work rooms, etc. Can be used in any position without risk of fire.

PRICE 25/-

Dimensions—Length 15½ in., Width 6½ in., height 4½ in.



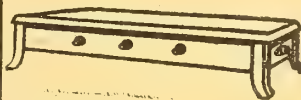
#### ELECTRIC

#### BOILING RING. List No. 57.

This will do all the same operations as an ordinary gas ring. Used for heating glue pots, and when loaded at 250 watts can be attached to any electric lampholder.

PRICE 15/-

Diameter 7 in.



#### ELECTRIC

#### HOT PLATE. List No. 18

Useful for keeping food warm, and also for drying purposes of all kinds.

PRICE 100/-

Size 36 in. by 18 in.



#### ELECTRIC

#### IMMERSION HEATER.

A reliable appliance for heating water, oil and other liquids. Can be easily fitted to existing tanks, etc.



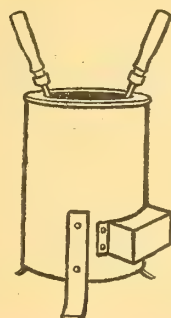
#### ELECTRIC

#### ENGINE WARMER.

For placing under engine in cold weather to prevent freezing. They are quite gas and fireproof.

PRICE 40/-

Size 12 in. by 7 in.



#### ELECTRIC

#### SOLDER POT. Type A.

This is the latest system for heating ordinary soldering irons, and consists of a pot of molten solder into which the irons are placed for a short time till heated.

PRICE 65/-

Dimensions—Outside diam. 8 in., inner pan 5½ in. diam. at top, Depth 7 in.

All the above prices are subject to an advance of 25 per cent.

Our Catalogue illustrates many other special appliances we make for Manufacturing Purposes, Munition and Factory Work, Hospitals, Mess Rooms, etc.

**BELLING & CO., MANUFACTURING ELEC. ENGRS.,**

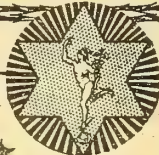
DERBY RD. WORKS, MONTAGUE RD., EDMONTON, LONDON, N. 18

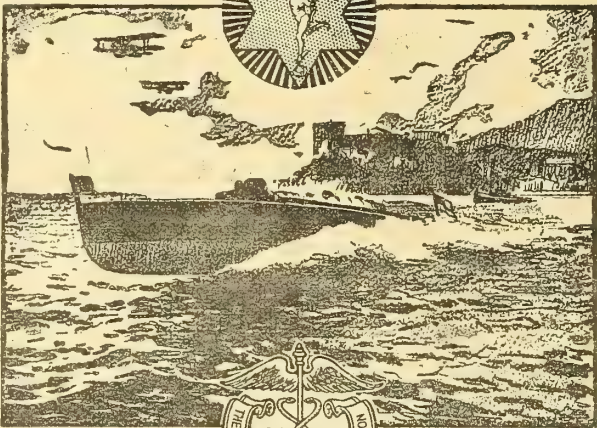



# S. E. SAUNDERS

LIMITED  
Est. 1830

## DESIGNERS & CONSTRUCTORS OF AIR AND MARINE CRAFT







*Head Office and Productive Works*

## EAST COWES. I.W.

*Erecting & Testing*

*Solent Yard, Cowes &  
Osborne Works, E. Cowes*

SEAPLANES

*West Medina Aerodrome  
East Cowes*

LAND MACHINES

*Telegrams "CONSUETA EAST COWES"*

*Phone COWES 193 (4 Lines)*



## PATENTS INDEX.

The subjoined list of recent inventions has been specially compiled by THE AEROPLANE from the current Official Patents Records.

## PATENT APPLICATIONS.

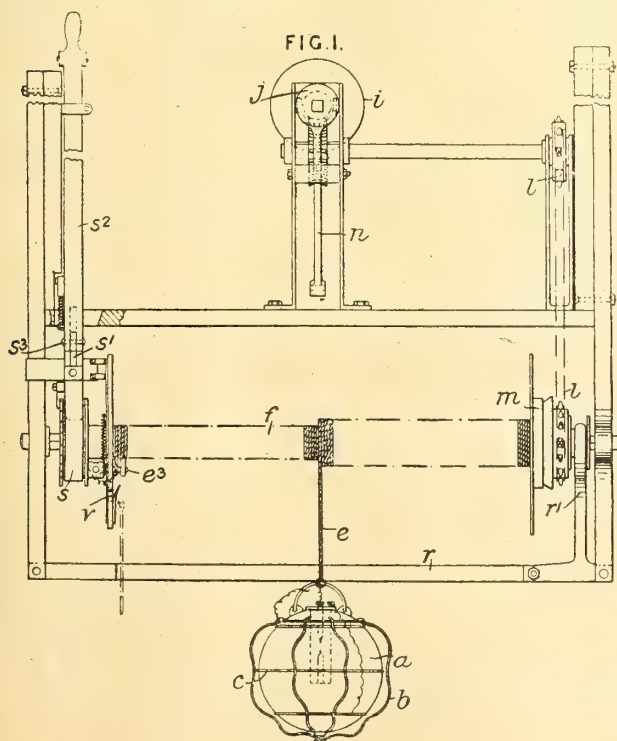
- Bloomer, F. Aircraft fairing. No. 4080. March 8th.  
 Cochrane, F. Treatment of fabrics to render them invisible. No. 4181. March 9th.  
 Cole, E. G. Captive, etc., balloons or airships. No. 3751. March 4th.  
 Collis, A. Automatic device for indicating position and angle in which aircraft is flying. No. 3910. March 6th.  
 Davidson, J. A. Aviators' and motorists' garments. No. 4179. March 9th.  
 Davies, W. O. Instrument for use on aeroplanes. No. 3967. March 7th.  
 Ellor, J. E. Aero engines. No. 3936. March 6th.  
 Eyncourt, Sir E. H. T. d. Means for starting aeroplanes, seaplanes, etc. No. 4154. March 9th.  
 Field, R. Spirit level, etc., for aircraft. No. 3742. March 4th.  
 Gardner, W. Anti-aircraft gun. No. 3839. March 5th.  
 Inglis, J. Aircraft wings. No. 3754. March 4th.  
 Jones, J. Level indicator for use on aeroplanes, etc. No. 4011. March 7th.  
 MacKinnon, W. E. Chrometers for aircraft. No. 3902. March 6th.  
 McPhee, R. Enabling machine-guns to be fired through revolving propeller blades of aircraft. No. 3956. March 6th.  
 Margetts, A. Power apparatus for starting motors of aircraft. No. 3765. March 4th.  
 Middleton, H. Airships and flying-machines. No. 3912. March 6th.  
 Poulsen, C. M. Aeroplanes. No. 3843. March 5th.  
 Prior, E. G. Aircraft. No. 3867. March 5th.  
 Sharp, A. Instruments and apparatus for aeronautical marine, etc., purposes. No. 3908. March 6th.  
 Westaway, J. Aeronautical machines. No. 3796. March 4th.  
 Yabsley, J. S. Level for aeroplanes. No. 3746. March 4th.

COMPLETE SPECIFICATIONS ACCEPTED, PRINTS OF WHICH CAN BE OBTAINED ON AND AFTER MARCH 28TH, 1918.

- 113,629. April 21st, 1917. Blakoe, R. Aeroplanes.  
 113,659. Feb. 28th, 1917. Dehn, F. B. Aeroplanes.  
 113,673. March 7th, 1917. Anderson, A. L., and Anderson, R. Locking-device for bracing wires or cables of aircraft and the like.  
 113,723. May 29th, 1917. Sopwith Aviation Co., and Hawker, H. G. Attachment of the aerofoils of aeroplanes.  
 113,736. June 29th, 1917. Jackson, W. J. Mellersh. Manufacture of aeroplane elements.  
 112,023. Jan. 27th, 1916. Pensuti, E. Speed indicators particularly for aerial machines.

## ABRIDGMENTS OF RECENTLY PUBLISHED SPECIFICATIONS.

- 112,472. Aerial Warfare. TAYLOR, I. F., 5, Upland Road,



East Dulwich, and PICK, S., 117, Queen Victoria Street, both in London.

Consists mainly in trailing bombs from aircraft by means of a power-driven winch under manual control. As shown, the bomb *a* is suspended by a cable *e* from a drum *f*, which is driven by a motor through gearing *j*, *l* and two clutches *i*, *m*. The clutch *i* is controlled through linkwork *n* by a hand-lever to connect and disconnect the motor. The clutch *m* is controlled by another hand-lever *S2*, which pivots about a fulcrum *S3* so as to shift the drum longitudinally; and a brake lever *S1* is provided adjacent the lever *S2*. These two levers enable the drum to be unclutched and the cable to be paid out under control of a band brake *S*. The clutch *m* is also controlled by a fork *r1* to unclutch the drum when the cable is fully wound up and the bomb *a* brought against a lever *r* connected to the fork *r1*. Electric leads are provided along the cable to connect the fuse on the bomb to a battery on the aircraft through a switch worked by hand and another switch worked by the hand-lever that controls the motor clutch *i*. A spring catch *e3* is provided to release the cable if it is subjected to excessive tension, and a knife *v* for simultaneously cutting the electric leads. The electric battery may be arranged in the bomb, electric leads being then not required. The circuit is closed on the impact of the bomb with the enemy by a wire cage around the bomb comprising two sets of wires *b*, *c*, which are made to touch each other by the impact. The bomb may be explosive, incendiary, or both. The incendiary charge consists of liquid hydrocarbons or substances impregnated therewith.

Reference has been directed by the Comptroller to Specifications 6029/09, 1135/10, 16133/13, 17033/13, and 16734/15.

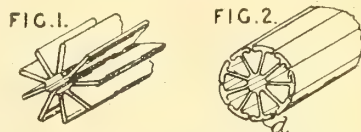
- 112,483. Aeroplane Dope. WHEATLEY, R., 115, Warrender Park Road, Edinburgh.

Relates to a dope for the fabrics of aeroplanes, kites, etc., and consists in a dope comprising a solution of acetyl-cellulose or nitro-cellulose or both with which is mixed a proportion of a suitable coloured substance which is soluble in the dope solution and will remain soluble in the dried dope. A specific example comprises the addition of "Oil Amber" to a butyl acetate solution of nitro-cellulose. A further example describes the application of a solution of "Oil Amber" in benzol and methyl alcohol to a doped fabric.

Reference has been directed by the Comptroller to Specification 105,137.

- 112,486. Tubes, stays, struts, etc. DICKSON, H. C., Halesowen Steel Co., Halesowen, Worcestershire, and FOLEY, W. H., 79, Ivor Road, Sparkhill, Birmingham.

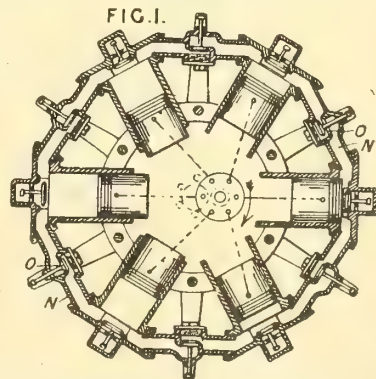
In tubes, stays, struts, etc., having webs of two thicknesses of metal in contact, the webs radiate from substantially the centre of cross-section in symmetrical arrangement, adjacent webs being inclined to one another at less than 90 degrees. The layers of each web, and adjacent webs, are integral, the tube, etc., being conveniently made from strip material by rolling or drawing. Preferably, an odd number of webs is used. The tube, etc., may have a simple star form, Fig. 1. As shown in Fig. 2, the webs have T-heads *d* which abut. In other forms, the webs have heads of circular or triangular cross-section. The tubes may be of circular oval, D, square, triangular, stream-line, or other cross-section, and either cylindrical or tapered.



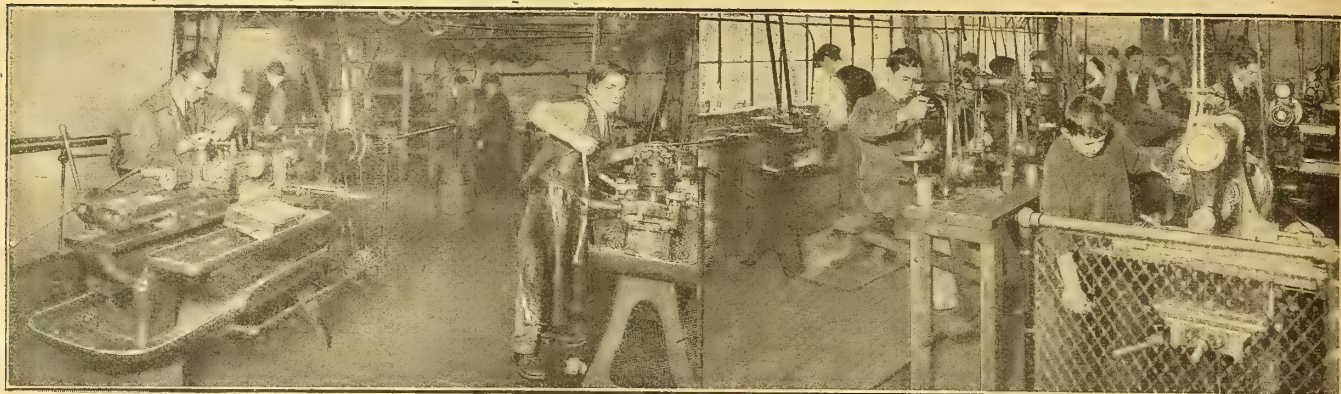
- 112,601. Internal-combustion Engines. RICHARDSON, A. N. W., Marton, Roscoe Street, Bondi, Sydney, Australia.

TWO-STROKE-CYCLE ENGINES.—In a multi-cylinder engine, a

portion of an ignited charge in one cylinder is transferred to another cylinder after the ignition therein of the main charge and when its piston has completed a part of its working stroke. The invention may be applied to a radial cylinder engine, Fig. 1, in which each cylinder is connected to cylinder next in the order of firing by a passage *N* containing a cam-actuated valve *O*. The valves are each opened substantially at the moment of ignition in the cylinder from which the gases are to be discharged.







## We have that Part you are Urgently Requiring.

**YOU** will find it in "Aircraft Supplies," our Fortnightly House Journal, which is published on alternate Wednesday evenings, and contains a complete list of Stock of Aircraft Parts up to the time of going to press, Current Prices, Details of New Items, Enquiry Bureau, Charts and Tables of various parts and Short Articles of Interest to Aircraft Manufacturers. It will pay you to receive copies regularly, and these will be sent free on application on official or business stationery.

Our average weekly output is over 1,650,000 parts, and we can supply your requirements from a tiny screw to a complete unit.

## THE "ASCOL" BOOK.

**WE** are printing the whole of the articles which have appeared in "Aircraft Supplies" in book form, which will be entitled "The 'Ascol' Book." This will also contain details of A.G.S. Parts as well as sections dealing with 'Ascol' Charts and a Beginner's Guide (which includes a great deal of information to those new to the industry), and a reprint of the Glossary of Aeronautical Terms, from "The Aeroplane Speaks," by kind permission of the publishers, Messrs. McBride, Nash & Co., Ltd. Complete details will be announced shortly. The book will be ready within four weeks, and will be sold for charity at 3/6 each. Orders from firms and others engaged in the industry should be sent in at once as the edition is limited.

## THE AIRCRAFT SUPPLIES COMPANY LTD

CONTRACTORS TO THE AIR BOARD.

Head Offices, Showrooms, and Stores:

**ASCOL HOUSE, 125 LONG ACRE, LONDON W.C.2.**

Representatives in Birmingham, Manchester, Leeds, Belfast, Northern Counties and Scotland, South Coast and the London District.

Managing Director:  
**G. H. MANSFIELD.**

Works:  
Little James St.  
London, W.C.1.



Telephone:  
Gerrard 276.  
(Private Branch Exchange.)

Telegrams:  
"Upcast, Read,"  
London.



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# THE AIRCRAFT TRADER

## MARKET TOPICS.

(Prices are for quantities on usual terms.)

March 14th, 1918.

**COPPER.**—Recent reports received from U.S.A. indicate that there is not now any fear of a serious shortage of Copper due to transport and fuel difficulties.

The Copper market shows very little alteration, supplies are coming through very regularly, for national requirements, and prices are strictly under control.

**TIN.**—This market is in a most unsatisfactory condition; recent shipments have been very small indeed. The outlook is not at all bright and to all appearances the present state of affairs will continue during the next two or three weeks.

With the uncertainty of supplies, prices will of course continue to fluctuate, £325 being paid on the 8th for cash.

### COMPARATIVE PRICES.

	To-day, 13th.
Last month .....	£311 10 0
Last year .....	£200 5 0
1916 .....	£192 5 0

**LEAD.**—Supplies appear to be quite satisfactory although there is only just about enough Lead to meet the demands for work of national importance. Prices continue unchanged.

**STEEL.**—Ample supplies of Steel are coming through the mills for aircraft work, and it is quite certain that the total output of the various mills engaged on these steels for the first three months of 1918 will constitute a record.

Supplies of High Speed Steel and Cast Steel are not as satisfactory. In fact, it is most difficult to obtain deliveries. Prices of all Steels continue unchanged.

**TIMBER.**—The situation is still most unsatisfactory. Very little Silver Spruce is coming into the country and the use of substitutes has, so far, not been of much assistance. The British Columbian Government are making a big effort to obtain a greater production of aeroplane Spruce in the Province; and an Order in Council has just been issued empowering the Minister of Lands to arrange for the immediate logging of aeroplane Spruce upon all areas of vacant Crown land; also to call upon all holders of Crown Timber, which is judged by the Lands Departments to be suitable for aeroplane timber, to have it immediately logged, and in default the Lands Department will arrange for the logging to be done immediately.

Mahogany supplies are fairly satisfactory, although recent shipments have not been very large. Prices continue unchanged.

**FABRIC.**—Supplies are fairly satisfactory and prices have not yet been altered.

## TRADE BENEVOLENCE.

Mr. A. J. Wilson, general hon. secretary and treasurer of the Cycle and Motor Trades Benevolent Fund, intimates that a new rule has been introduced into the regulations of the fund throwing the membership of the fund open to persons engaged in the Aircraft Industry. So far the Aircraft Industry has not found any necessity for forming a benevolent fund of its own, and failing the formation of such a fund it seems that employees in the Aircraft Industry, especially those who have entered the Industry from the cycle and motor trades as a number of employees have done, would do well to join the C. and M. T. Benevolent Fund. The address of the secretary is 154, Clerkenwell Road, E.C.1.

## A SPENCER KITE BALLOON.

The many thousands of people who saw a kite balloon aloft in the Westminster district on March 7th and 8th, advertising War Loan, may be interested to hear that the balloon was a model lent by C. G. Spencer & Sons, Ltd., the well-known balloon manufacturers of Highbury, who also patriotically presented several thousands of rubber balloons printed with War Loan advertisements and a number of parachutes which were thrown from aircraft passing over London during the Tank Bank week. No doubt considerable competition has ensued for the possession of these relics.

The Directors of C. G. Spencer & Sons, Ltd., have never neglected their opportunity of expressing their patriotic sentiments, and this occasion is only one of many in which their generosity for the public good has been manifested.

## MR. BERNARD ISAAC'S MOVE.

The rapid expansion of the Aircraft Industry is indicated by the frequent changes in administration which take place. Among recent moves of importance one learns that Mr. Bernard Isaac has resigned his directorship of the Aircraft Supplies Co., Ltd., to become more closely associated with the design, manufacture, and supply of aircraft and aircraft parts and equipment.

In consequence of the change, the Aircraft Supplies Co., Ltd., has removed its West End offices (166, Piccadilly) to the head offices at 125, Long Acre, London, W.C.2, to which address, in future, all communications intended for this firm should be sent.

Mr. Isaac will continue to direct the interests of the Procter-Isaac Aviation Company (at 166, Piccadilly, London, W.1.), which firm is carrying out much valuable experimental and testing work on various types of land machines and seaplanes for many of the most important designing and constructing firms in this country.

On the commercial side Mr. Isaac is one of the pioneers of aviation. He first came into the Aircraft Industry in 1908, and he is well known for his work in connection with the Hendon Aerodrome, in the organisation of which he was associated with Mr. Grahame-White and the late Mr. Richard T. Gates. He is the compiler of "Standard A.G.S. Parts for Aircraft"—a book which has been of very great assistance to the Aircraft Industry and the Air Services during the war, and an interesting contrast to this is "The First Aeroplane Catalogue," which was issued by Mr. Isaac as far back as 1909, when he founded the Aeroplane Supply Co., Ltd.

An article by Mr. Isaac, on "The Standardisation of Minor Aircraft Parts," which was published in this paper some time ago, showed that he has foresight and a sound knowledge of his work. He has one's best wishes for his continued success, and one feels sure that his enterprise will continue to be of great and increasing value to the Aircraft Industry.

## FLAX CONTROL.

The Flax Control Board announce that an Order has been made by the Army Council under the Defence of the Realm Regulations, amending the Flax Yarns (Shipment from Ireland) Order, 1918, by providing that the permit of the Flax Control Board must be obtained for shipment of flax line or tow yarns both to and from Ireland. Applications for such permits should be made in the case of shipment from Ireland to the Irish Sub-Committee, 31, Wellington Place, Belfast, and in the case of shipment to Ireland to the Scottish Sub-Committee, 10, Victoria Chambers, Dundee.

## A CURIOUS PROSECUTION.

At Middlesex Sessions, on March 11th, Frank Clement Meering, 10, an air pilot, the son of a City silk merchant, living at Finchley, and John Charles Martin, 31, were acquitted of a charge of stealing a quantity of aeroplane articles from the Grahame-White Aviation Company, Ltd.

Mr. Holman Gregory, K.C., for the defence, stated that the case was one of the most cruel prosecutions that had taken place for many years, and that it had been brought up without consideration or inquiry. The lad was article to the company when he was 17 years of age, and now was filling up his time before joining the Army by acting as an instructor to pilots. He had invented an aeroplane which, it was believed, would be faster than any yet built. Having difficulty in getting necessary parts, he mentioned the fact at the aerodrome, and it was suggested that he should go to Martin and obtain the necessary goods through the company if they were willing to sell.

Mr. Meering, in evidence, said that he had taught scores of officers who were now flying at the front. The wire strainers which it was alleged that he had stolen he had made himself from wire purchased from the company. He understood that he could purchase from Martin, and had always been ready to pay whenever Martin told him the amount.

Mr. Meering's father produced receipts for purchases which had been made from the company by his son. Lieutenant Culver described how he landed at the aerodrome on one occasion with a burst tyre, and borrowed a tube from the school. He said that he lived in the same house as the lad, and it was he, and not Meering, who left the tube (which it was alleged had been stolen) in the stable.

Mr. Montagu Sharpe, the Chairman, stopped the case. In discharging Meering he said that he was very sorry that he had been called upon to undergo that trial at the threshold of an honourable career in which he wished him all success.



*Britain Supreme in the Air!*

# ROLLS-ROYCE AERO ENGINES

like Rolls-Royce Cars are the best in the World. By their wonderful achievements they are making Britain and her Allies Supreme in the Air.

*Describing the historic flight from London to Constantinople in thirty hours the "Autocar" says:*

"The fact must be recorded that the Engine never failed for a moment throughout the entire journey to Constantinople. Great therefore as was the reputation of the Rolls-Royce Engine before the flight, the epic achievement described added new laurels to its wonderful career."

# ROLLS-ROYCE

Contractors to H.M. Government.

LTD.

14 AND 15, CONDUIT STREET, LONDON, W.C. 1.

Telegrams: 'Rollhead Reg, London.'

Telephones: 1654 Gerrard (3 lines)

AND AT DERBY, PARIS, NEW YORK, MADRID, BOMBAY, ETC.



# AIRCRAFT FINANCE

## AGAIN WHITEHEAD AIRCRAFT, LTD.

A repetition of the flamboyant advertising campaign with the usual blatantly exaggerated headings concerning this company appears once more in the Press of this country.

The appeal to the patriotic public to subscribe for shares in Whitehead Aircraft, Ltd., "to help win the war," the statements such as "the shares will have a value now which as the years pass will be like railway shares," etc., etc., savour more of the clap-trap of American pill cure-all-and-everything type, than the serious efforts of a British company with a capital of one million sterling.

## PREVIOUS NOTES.

In November of last year, in consequence of the number of inquiries received as a result of the extraordinary advertising campaign then being carried on in the Press in connection with this company, I felt it a duty to examine the records filed at Somerset House, in the interest of my readers and correspondents and more particularly for the sake of the Aircraft Industry and its reputation. The details concerning the organisation of the company appeared to be so unusual and arbitrary, the protection for investing shareholders being in every respect not only disregarded but set at defiance, that the following notes concerning this company were published:—

THE AEROPLANE, Nov. 7th, 1917, page 1367

This Company was registered on September 7th, 1917, with a capital of £1,000,000.

Clause 98a of the Memorandum and Articles of Association of the Company provides that:—

"Mr. A. J. Whitehead is nominated Governing Director of the Company for life, with the continuing right to appoint two directors who shall not be subject to retirement by rotation.

"They shall continue in office unless requested by the Governing Director to resign.

"No Meeting of Directors or Resolution passed by the Board shall be valid unless the Governing Director is in attendance, and shall as to such resolution vote in favour thereof.

"In the event of the Governing Director ceasing to be Governing Director, he shall have the power to appoint another to such office in his stead, and in the event of the Governing Director dying, his legal personal representative shall have power to appoint another to such office, and such appointment shall, in either case, have all the rights and powers hereby conferred on the Governing Director."

Paragraph 114:—A Director shall be disqualified (F) if he receives a notice signed by all the other Directors, not being less than three, and including the Governing Director, requiring him to resign.

Paragraph 115:—No Director shall be disqualified by his office through contracting with the Company, providing he discloses his interest, but this prohibition shall not apply as to A. J. Whitehead or his alternate.

Such autocratic powers are fortunately a novelty in connection with English companies. One learns that the qualification of the Governing Director is that he shall merely be a shareholder, and is qualified to hold office providing he owns one share, which may be a deferred share of the nominal value of 1s.

He has power to nominate two Directors besides himself, who may be called upon at any time and in any circumstances it may please him, to vacate office. What type of Director would hold office under such conditions is hard to imagine. But that no meeting of Directors or Resolution is valid unless the Governing Director is in attendance, and shall vote in favour of the Resolution, means, if it means anything at all, that Mr. Whitehead and Mr. Whitehead alone, may, notwithstanding all the protective clauses of the Companies Acts, do just what he wills, when and how he pleases, even if he only holds one deferred share of a nominal value of 1s.

THE AEROPLANE, Nov. 21st, 1917, page 1525.

Before, however, proceeding to criticise the methods of the company, I would ask Mr. Whitehead, in the interests we claim to represent, to be good enough to reply to the following questions:—

- (1) How many shares have been issued and allotted since the incorporation of this company on Sept. 7th, 1917, and
- (2) Whether the subscribers to these shares have any know-

ledge of the existing arrangements (a) under the terms of the articles of association between Mr. Whitehead and the company, and (b) of the private arrangements made to cover the cost of advertising and issue of shares?

THE AEROPLANE, Nov. 28th, 1917, page 1605.

In my notes of last week I asked Mr. Whitehead two questions of public interest relating to this company, in connection with the company's advertisements, which still continue to appear in the Press. Up to the time of writing no reply has been received from Mr. Whitehead or from the company. In view of the whole circumstances this, by no means, is a matter of surprise. Correspondence continues to arrive from readers of this article, which demands that further queries should be put. There are further important details which require elucidation. Over and above the capitalisation of £1,000,000, there would appear to be two mortgages, a first mortgage of £150,000 and a second mortgage of £80,000, which apparently form part of the original purchase consideration. But since the incorporation further mortgages have been created, one for £1,400 and another for £2,900, and, further, the records show that the company have also contracted to take over all the liabilities of the old company. In view of all these mortgage and prior charges ranking in front of the shareholders, it would be interesting to publish details showing how far this company thereby becomes further involved.

## THE LATEST MOVE.

Notwithstanding the official advertisement of the company, to the effect that a prospectus was in course of preparation, and that steps were being taken to obtain Treasury consent for a public issue of its share capital, I am informed that there has been filed with the Registrar of Companies "a statement in lieu of prospectus." This statement sets out that the estimated preliminary expenses of the company amount to £6,000. Some explanation of these contradictory facts appear necessary.

To obtain subscriptions from the public without any disclosure of such material facts is a dangerous method of carrying on any company. If the company wants funds and the business in hand or prospective merits confidence, there is only one way to act—that is, openly and honestly. Publish the facts and the figures by the issue of a properly accredited prospectus complying with the formalities required by the Companies' Acts, which were framed for the protection of shareholders. Show the investing public what it should know, and we shall have accomplished all that duty demands.

## EXPERIMENTAL COSTS AND EXCESS PROFITS.

In a detailed article discussing the British Aircraft Industry in 1917, published in this journal in its issue of February 6th last, the Editor incidentally referred to the much-vexed and important question of excess profits in particular relation to the unfortunate position of aircraft firms compelled to sink capital in experiments. The statement, which can in no way be regarded as a studied detailed analysis of the subject, was as follows:—

"Unfortunately capital sunk in experiments, which any ordinary auditor would put into the balance sheet as 'good-will' and class as a capital asset, does not appear to be regarded by Government auditors as capital. It seems that the only capital recognised by officialdom is the amount represented by the excess of assets over liabilities, and on this amount alone is the meagre interest permitted by law allowed to be estimated."

The publication of this view has apparently caused some stir, and I am indebted to a correspondent for sending me a cutting on the subject, from another publication. The Editor of THE AEROPLANE, no doubt, may not consider the writer's criticism worthy of any attention, but as the adverse views expressed may lead to some confusion I desire to say that as regards the manner such outlays are dealt with from the point of view of taxation it is immaterial, inasmuch as the assessors are limited by the sections of the Finance Acts when computing what are assets and the amount of profit taxable.

It is, however, quite a different matter when considered from a company, a shareholder, or the auditor's point of view. As a matter of equity it would be wrong to make the shareholder in one particular year support the whole of the expense of experiments which may be necessary for the establishment of a business.



Only the particular detail of the expense would decide under what heading the amount should properly appear. It might be "Goodwill" (to which such exception is taken), or it might be establishment charges or any other capital expenditure account. All right, just and proper accounts which, however, officialdom legally ignore, but which makes the Editor's view as expressed in the article above referred to all the more cogent and timely, whilst the writer of the hypercritical adverse comments appears to have missed the point.—G. A.

## COMPANIES ANNOUNCEMENTS.

### NEW COMPANIES.

The files of the following new companies are available for inspection at Somerset House.

**LLOYD, DIX & CO., LTD.**—Private company. Registered March 8th. Capital £1,000 in £1 shares. To take over the business of moulding manufacturers and picture frame makers carried on by G. T. Lloyd and R. W. Dix at Great Grimsby; also to carry on the business of photo frame picture and fire screen manufacturers, timber merchants, manufacturers of and dealers in wooden parts and fittings of aeroplanes, etc. The subscribers (each with one share) are:—H. Bennett, Newlyn, Weelsby Road, Grimsby, moulding manufacturer; R. Jennison, Lamorna, Humberstone Avenue, Grimsby, moulding manufacturer; G. T. Lloyd, 20, Macaulay Street, Grimsby, moulding manufacturer; R. W. Dix, 33, Cromwell Avenue, Grimsby, moulding manufacturer. The first directors are: H. Bennett, R. Jennison, G. T. Lloyd and R. W. Dix. Registered office: 132, King Edward Street, Great Grimsby.

### MORTGAGES, CHARGES AND SATISFACTIONS.

**AIRCRAFT MANUFACTURING CO., LTD.**—Registered March and, 1918. Mortgage for £190,000, secured by a general charge on the company's assets.

**THOMPSON (NORMAN) FLIGHT CO., LTD.** (formerly White and Thompson, Ltd.). Bognor.—Registered February 28th, 1918. Debentures for £30,000, secured by a general charge on the company's assets.

**WHITEHEAD AIRCRAFT (1917), LTD., RICHMOND, SURREY.**—Registered March 1st, 1918. Mortgage Debentures for £150,000 (with a premium of 2½ per cent.) secured by Trust Deed, dated February 21st, 1918. Charged on freehold hereditaments and premises at Richmond, freehold estates and buildings at Hanworth and Feltham, and leasehold premises at Richmond and a general charge on the company's assets.

### SATISFACTIONS.

**AIRCRAFT MANUFACTURING CO., LTD.**—Registered March 4th, 1918. £10,000 filed October 8th, 1913.

**PAGE (HANDLEY), LTD.**—Registered March 4th, 1918. All moneys due, etc., filed Aug. 25th, 1915; all moneys due, etc., filed May 30th, 1917, and all moneys due etc., filed June 14th, 1917.

## CAPITAL AND LABOUR.

The twenty-first annual meeting of the shareholders of Crossley Bros., Ltd., was held in Manchester recently. The chairman (Sir Kenneth Crossley, Bart.), who presided, made the following interesting remarks on the relations of capital and labour:—

We have heard something lately about a levy on capital; naturally the proposition sounds most attractive on the surface to so-called wage earners, but if they will only go a little deeper and study the economics of the question, I think they may alter their views. Putting aside the obvious injustice of confiscating the property of a very large class of people—many of them not so well off as those earning high salaries, or fees, or wages; and the impossibility of realising a fair proportion of such a levy in a useful form—nothing would do more harm to the confidence and credit which our country, above all others, is so dependent on.

Surely this war, when we have won it, must be paid for by an expansion of our industries and by the free development

of our Empire's enormous resources, and not by discouraging all incentive to individual effort—nothing in the end would react so disastrously on all those who labour with hand and brain. In war time, of course, the present system of control (though we shall be all thankful when it ends) is very necessary and occasionally very helpful. We have no quarrels with any of the departments we have to deal with. The wisdom of their decisions does not always appear to us, in our ignorance, to resemble that of Solomon, but we try to carry them out loyally.

### THE RESPONSIBILITY OF ENGINEERS.

Excess profits, or any other kind of profit, or loss, rates of wages, conscription of capital, even future relations between employers and employed, all these are as nothing compared with our one great object—a real victory over the Germans. We are coming to a time when we shall need all the pluck and endurance and unity we can command.

This is an engineers' war in more ways than one, and engineers are well off—almost pampered compared with other classes and other trades. Most of us have large contracts at fair prices, wages are higher than they have ever been, we live in comparative comfort and work with the eyes of all the world watching us—sometimes approvingly, but at other times I am sorry to say with anxiety, and occasionally even with disgust. After the sailors and soldiers, we and the farmers can do more than anyone else, and that privilege carries great responsibilities; so, gentlemen, whether we are members of the A.S.E. or only long-suffering shareholders, temporarily deprived of a portion of our modest dividends, we have simply got to see this job through.

### EMPLOYERS AND EMPLOYEES.

There is no use blinking at the fact that some trade unionists have not gained in popular esteem during the last few months, and this is not the fault of their employers. Their officials know and their shop stewards are beginning to know, that there is far more sympathy and goodwill on the part of employers than they had imagined.

Their quarrel has not been so much with us as with the Government. The younger members of the so-called rank and file have been allowed to drift, or rather to manoeuvre themselves into the entirely false position of imagining that they are a privileged class, exempt from military service owing to their skill; whereas, in justice to the whole nation, they must surely see that they are only exempt for just so long as it suits the Government to keep them at work on munitions.

This is straight talk, gentlemen, but our own men, I know, will not think any the worse of me for saying what I feel to be true. The Openshaw and Gorton districts of Manchester have for the last 30 or 40 years contained a large proportion of the best skilled men in the engineering trade—men who have never been shy of expressing their opinions, verbally or otherwise, but, in spite of some anxieties, it is my firm conviction that the great majority of them realise what we are up against.

They hate the Hun and all his ways, and the whole tendency of their moral and sporting instincts will save us from its ever being said that the country was let down by its engineers. In short, they will play the game until our outside enemies are disposed of, and by that time there is every chance that some really definite progress will have been made to settle the relations between employers and employed on a more satisfactory basis.

It is only a platitude to say that labour must have a greater share in the fruits of industry. Of course it must—better housing and education, shorter hours, work under more pleasant conditions, a more direct and tangible interest in the results—all this must come, and the sooner the better, but in the meantime there is only one thing to go for—without which everything else fails—we must all pull together until victory is final.

I have said nothing about our office and works staff; they have worked like Trojans, both women and men, but praise of civilians seems rather out of place just now compared with our sailors and soldiers. I only hope we may be able to welcome them back by this time next year.

## CURRENT SHARE QUOTATIONS.

March 19th, 1918.

Aircraft Mfg. Co.	7% cum. pref. £1 ...	22/-	23/-
	7% cum. & ptg. "B" pref., (fully paid) ...	21/-	22/-
Armstrong (Sir W. G.) Whitworth & Co., Ltd.	4% cum. pref. £5 ...	32	33
	5% 2nd. pref. £1 ...	17/-	18/-
Austin Motor Co., Ltd.	£1 ordinary ...	42/-	43/-
	7% cum. pref. £1 ...	18/-	19/-
Birmingham Small Arms Co., Ltd.	£1 ordinary ...	26/-	27/-
	£1 ordinary ...	58/-	59/-
	5% cum. "A" pref. ...	48	49
	6% cum. "B" pref. ...	20/-	21/-
Boulton & Paul, Ltd.	5% cum. pref. £1 ...	4	4
Brown Bros., Ltd.	6% cum. pref. £5 ...	43	43
Darracq (A) & Co., (1905) Ltd.	£1 ordinary ...	34/-	35/-
	7% cum. pref. £1 ...	23/-	24/-
Electric Construction Co., Ltd.	7% cum. pref. £1 ...	20/-	21/-
	£1 ordinary ...	25/-	26/-
Fellows Magneto pref.	8% cum. partip. ...	17/-	17 6

General Electric Co., Ltd.	6% cum. pref. £10 ...	10 1/2	10 1/2
	£10 ordinary ...	19 1/2	20
Gwynnes, Ltd.	5% cum. pref. ...	58	59
	Ordinary ...	41/-	42/-
Greenwood & Batley, Ltd.	£10 ordinary ...	13 1/2	14
Humber, Ltd.	6% cum. pref. £1 ...	15/-	15 6
	£1 ordinary ...	20/-	21/-
Napier (D) & Son, Ltd.	£1 7 1/2% cum. pf. £1 ...	18/-	19/-
	£1 ordinary ...	34/-	35/-
Peter Hooker, Ltd.	£1 7% cum. partip. 1st pref. ...	19/-	20/-
	Ordinary ...	75/-	76/-
Rolls Royce, Ltd.	£1 ordinary ...	45/-	46/-
Rudge Whitworth, Ltd.	£1 ordinary ...	28/-	29/-
Ruston, Proctor & Co., Ltd.	5% cum. pref. £1 ...	16/-	17/-
Sunbeam Motor Car Co., Ltd.	£1 ord. ...	79/-	80/-
Straker Squire, Ltd. (1913),	£1 ordinary ...	22/-	23/-
S. Smith & Son, Ltd. (Motor Accessories)	£1 ordinary ...	27/-	28/-

Triplex Safety Glass, £1 ordinary...	...	27/-	28/-
Vickers, Ltd., 5 <sup>1</sup> / <sub>2</sub> pref. stock...	...	78	82
5 <sup>1</sup> / <sub>2</sub> pref. shares. £1	...	17/6	18/-
£1 ordinary	...	44/-	45/-
Wm. Beardmore & Co., Ltd., 6 <sup>1</sup> / <sub>4</sub> c. pf. £1	...	19/-	20/-

### GENERAL INFORMATION.

Armstrong, Whitworth (1916).	Owing to the difficulty of estimating liabilities under Finance and Munitions Acts, the accounts will not be ready until a later date.
Austin Motor (1916).	
B'ham Small Arms (1915-16).	
Rolls Royce.	
Rudge Whitworth.	
Straker-Squire (1915).	
Sunbeam Motor.	x—ex dividend
Thornycroft (J. I.) & Co.	
Vickers (1915 and 1916).	



TELEGRAMS :: :: :: DEPENDABLE, NEWCASTLE-ON-TYNE.  
PHONES :: :: :: 2604 CENTRAL (5 LINES).

JOHN DAWSON  
AND COMPANY  
(NEWCASTLE-ON-TYNE),  
LIMITED.



AIRCRAFTSMEN



NEWCASTLE-ON-TYNE.





# **AIRCRAFT MANUFACTURING COMPANY———LIMITED**

**Contractors to  
War Office and Admiralty**

**London Office**

**27, BUCKINGHAM GATE, S.W.1.**

**Offices & Works**

**HENDON, N.W.9.**



(Continued from page 1070.)

During the usual offensive patrols enemy trenches were attacked by machine-gun fire, and two enemy machines were shot down in flames, one crashing into the sea. A hostile kite balloon which had broken adrift was also shot down.

One of our machines is missing.

MARCH 14th.—On March 12th two British seaplanes encountered and attacked five enemy aircraft in the southern part of the North Sea.

An engagement took place, which lasted for thirty minutes.

One enemy two-seater was shot down and destroyed, the observer of a second machine was killed, and a third seaplane was driven down on the water.

The engagement terminated when the British seaplanes had expended all their ammunition.

Both machines returned safely.

MARCH 18th.—During offensive patrols carried out by R.N.A.S. machines from Dunkirk from March 14th to 17th, five enemy machines were destroyed and five shot down out of control.

In addition, in one engagement two enemy observers were seen to have been killed.

All our machines returned safely.

## THE CASUALTY LIST.

Reported March 14th.

DIED OF INJURIES ACCIDENTALLY SUSTAINED.—Smith, F. A., Actg. Air Mech., 1st Gde., F.33078.

Reported March 15th.

ACCIDENTALLY KILLED.—Stevens, Prob. Flt. Officer W. J., R.N. Dobson, Prob. Flt. Officer R., R.N.

PREVIOUSLY REPORTED MISSING (BELIEVED DROWNED), NOW PRESUMED DROWNED.—MacAloney, Flt. Sub-Lt. R. G., R.N.

DIED OF INJURIES.—Whiting, Prob. Flt. Officer B. H., R.N.

Crosby, Prob. Flt. Officer A. W. G., R.N.

MISSING.—Campbell, Flt. Sub-Lt. K. D., R.N.

Casgrain, Flt. Sub-Lt. H. R., R.N.

SERIOUSLY WOUNDED.—Bannatyne, Flt. Sub-Lt. A. M. R.N.

WOUNDED.—Carter, Flt. Sub-Lt. B. R., R.N.

ACCIDENTALLY INJURED.—Ellis, Flt. Lt. D. F., R.N.

Bacon, Flt. Sub-Lt. F. J. H., R.N.

Shaw, Prob. Flt. Officer F. B., R.N.

Knight, Prob. Flt. Officer J. H., R.N.

Clark, Prob. Flt. Officer H. J., R.N.

## PERSONAL NOTICES

## DEATHS.

EMMETT.—Flt. Sub-Lt. Cyril William Emmett, R.N., was the youngest son of Richard Emmett, M.D., J.P., and Mrs. Emmett, of Winton, Portsmouth. He was accidentally killed, while on active service, on March 15th, aged 19. He was educated at Lynam's Preparatory School, Oxford, and Repton College, and entered the R.N.A.S. in May, 1917. He went overseas on Jan. 16th.

HASSETT.—Arthur Clark Hassett, R.N.A.S., who died on March 10th, at the Middlesex Hospital, after a severe operation, was the second son of Joseph Hassett, late of Oxford Street, W., and husband of Mabel Hassett.

SIMPSON.—On March 16th, at Thames Ditton, in a nursing home, after an illness contracted on active service with the R.N.A.S., Walter Septimus Simpson, husband of Emily Duncan Simpson, of 38, Trebovir Road, in his 54th year.

SWINBURNE.—Flt. Sub-Lt. T. R. Swinburne, R.N., who has been missing since June 8th, is now presumed by the Admiralty to have been killed on that date. He was the only son of Major and Mrs. T. B. Swinburne, of Holmwood, Beechwood Avenue, Finchley, and formerly of Glassensikes, Darlington. Born in February, 1898, he was educated at Westminster School, and King's College, London. Joining the R.N.A.S. in June, 1916, he went to France in May, 1917.

TURNER.—Prob. Flt. Officer Warwick Hackwood Turner, R.N., died on March 10th, after an operation, aged 18. He was the eldest son of Mr. and Mrs. Alfred Turner, of The Manor House, Twickenham, and was educated at the Old College, Windermere, at Bowden House, Seaford, and at Haileybury.

## MARRIAGES.

COLLET—CULLING.—On the 12th inst., at Romford Parish Church, Flt. Lt. R. H. Collet, D.S.C., R.N., youngest son of Mr. and Mrs. Collet, of Lansdowne, Millbrook, Southampton, and brother of the late Capt. C. H. Collet, D.S.O., R.M.A., was married to Mahala Margaret Culling, youngest daughter of Mr. and Mrs. Culling, of Romford.

JACKSON—SELLE.—On March 16th, at the Parish Church, Barnes, A. Edward Jackson, R.N.A.S., younger son of Mr. and Mrs. William Jackson, of Waddon, was married to Lilian Olive, youngest daughter of the late Guarnarius Sellé and Mrs. Sellé, of Barnes, by the Rev. B. M. Kitson.

A memorial service was held for Flt. Lt. C. H. Murray Chapman, R.N., at Christ Church, Lancaster Gate, on Monday, March 18th.

Flt.-Comdr. E. R. Moon, D.S.O., R.N.A.S., has been awarded the Royal Humane Society's silver medal for his gallant and prolonged attempt to save Comdr. Bridgeman, R.N., in Jan., 1917, when their seaplane came down in the delta of the Rufiji River, East Africa, and was burnt.

\* \* \*

His many friends and acquaintances in the Services and in the Aircraft Industry will be interested to hear that Flight-Commander Farnall Thurstan, R.N., has left the R.N.A.S. after three years' continuous service. It is to be hoped that this does not indicate his severance from aeronautics, for, as a pioneer of the Aircraft Industry, his exceptional ability and experience should be used to good purpose for the furtherance of flying. Mr. Thurstan will be remembered as the ambassador of the Bristol Company to all foreign Powers before the war, and it is permanent testimony to his business ability that he was able to sell British aeroplanes to such widely diverse people as those of Spain, Russia, Roumania, Germany, France, Italy and Austria when the world was at peace and the British Government took no interest in aeroplanes. He also visited India and roused their first interest in flying among many officers who have since done brilliant service in the R.F.C.

Right at the beginning of the war he joined the R.N.A.S., and was the means of securing for this country, by his personal influence, a large quantity of French aeroplane matériel, which would otherwise not have been available, and without which we should have been in a very evil state. His adventures with a big batch of Gnome engines were related in a 1914 issue of this paper. His work in thus promoting good feeling and facilitating interchange of matériel between the French and British supply departments won high commendation in both countries from exalted officials.

Later, he was employed on purely technical work, and more recently he went on a special mission to Canada. In the old days before the war, Mr. Thurstan was known to all as an exceptionally able business man. The addition of three years' Service experience to his natural abilities, should make him a valuable acquisition now to any firm which is in earnest about remaining in the Aircraft Industry after the war.

## MILITARY.

## G.H.Q. COMMUNIQUÉS.

MARCH 12th, 10.17 p.m.—Another fine day on the 11th instant enabled our aeroplanes to continue their activity. Visibility, however, was again poor and prevented work with the artillery from achieving much success. Many photographs were taken by us, and several reconnaissances were carried out well to the east of the line.

Over 500 bombs were dropped by our aeroplanes, the chief target being the large sidings and ammunition dépôts at Aulnoye (south-east of Maubeuge) and ammunition dépôts south of Valenciennes, south-east of Cambrai, and south of Douai.

The enemy's aeroplanes were also active, and attacked our bombing machines.

As the result of air fighting ten hostile machines were brought down and seven others were driven down out of control. In addition a German observation balloon was attacked, and brought down in flames.

Two of our machines are missing.

After dark most of our night-bombing machines were again prevented from leaving the ground by mist, but on the southern portion of our front, where the night was clear, 200 bombs were dropped by us on a hostile ammunition dump and railway sidings north-east of St. Quentin.

All our machines returned.

The enemy also dropped a few bombs during the night, but lost a four-seater machine, which landed in our lines. The occupants were taken prisoners.

On the 12th inst. another daylight raid into Germany, making the third within the last four days, was carried out by our aeroplanes.

On this occasion the factories and station and the barracks at Coblentz (at the junction of the Rhine and the Moselle) were attacked. Over a ton of bombs were dropped, and bursts were seen on all the objectives, causing two fires. A hit obtained upon a building in the south-west corner of the town created a very large explosion.

A few enemy machines were encountered, but all our machines returned safely.

MARCH 13th, 10.3 p.m.—During the night of the 11th-12th instant, in addition to the raids reported in last night's communiqué, over three tons of bombs were dropped by us on Bruges Docks. All our machines returned.

On the 12th instant a distinct improvement in visibility enabled more work to be done by our aeroplanes in conjunction with the artillery than has been possible during the last few days.

Many reconnaissances also were carried out and photographs were taken. Bombing was continued with even greater vigour than on previous days.



Over thirteen and a half tons of bombs were dropped by us on various targets, which included the railway sidings at Mons and at Bavai (midway between Valenciennes and Maubeuge), on large ammunition depôts north-east of St. Quentin, and south of Douai, and on hostile billets east of Lens.

In the course of the fighting, which was continuous throughout the day, 14 German machines were brought down, and eight others were driven down out of control. One hostile observation balloon was also destroyed.

Six of our aeroplanes are missing.

During the night of the 12th-13th inst., seven tons of bombs were dropped on the enemy's billets between Lille and Cambrai. All our machines returned.

On the afternoon of the 13th inst., our squadrons attacked the munition works and barracks at Freiburg, in Germany. All our machines reached their objectives, and nearly a ton of bombs was dropped.

Further details of the raid have not yet been received.

MARCH 14th, 9.47 p.m.—On the 14th inst. our aeroplanes were again able to accomplish a full day's work in the air, and reconnaissance, bombing, photographic, and artillery work was continued as on previous days.

Seven hundred bombs were dropped by us on the enemy's rest billets and ammunition dumps and on the railway sidings at Courtrai and Denain (south of Valenciennes). An aerodrome occupied by some of the enemy's night-flying squadrons was also attacked.

Fighting was most severe, encounters taking place between large formations of our own and the enemy's aeroplanes. Nineteen hostile machines were brought down and five others driven down out of control.

Five of our machines are missing.

During the recent spell of fine weather the Australian and Naval Squadrons attached to the Royal Flying Corps have again proved of the greatest value.

The following further information has been received regarding the raid on the German town of Freiburg reported yesterday. The bombs dropped by us were seen to burst on the railway station and round the power station. Just after our pilots had released their bombs our formation was attacked by a large number of hostile machines. A fierce fight ensued, which lasted until all the enemy's machines were forced to withdraw.

Three of our machines have not returned.

MARCH 15th, 10.2 p.m.—On the morning of the 14th inst. rain prevented flying, but in the afternoon the weather cleared.

Bombs were dropped by our aeroplanes on the enemy's rest billets, on a railhead near Lille, and on an aerodrome 20 miles north-east of St. Quentin, used by night-flying aeroplanes.

Another hostile aerodrome, due east of St. Quentin, was attacked by a large number of our machines. Bombs were dropped from a low height on to the hangars, one of which was set on fire, while two others were badly damaged. On the homeward flight horse transport, troops, and motor-cars were fired on with machine-guns.

None of our machines is missing.

MARCH 16th, 9.32 p.m.—On the 15th inst. our aeroplanes were again active. Reconnaissance and artillery work, photography, and bombing were continued, and a great deal of fighting took place east of the lines on the whole front.

Over 12 tons of bombs were dropped by us on hostile rest billets, ammunition depôts, and aerodromes.

A successful raid was carried out upon the important railway sidings at Hirson, where hits were obtained on the railway.

Twelve hostile machines were brought down by our aeroplanes and seven others were driven down out of control.

None of our machines is missing.

After dark the aerial activity was continued by our night-flying machines until early morning. Over 8½ tons of bombs were dropped on the enemy's rest billets.

All our machines returned.

On the 16th inst. further military objectives in Germany were attacked by our aeroplanes. Fourteen heavy and 10 lighter bombs were dropped on the barracks, munition factories, and railway station of Zweibrücken. Bursts were seen on the barracks and all round the railway station.

The formation was attacked by hostile scouts and engaged by anti-aircraft guns, but all machines returned.

MARCH 17th, 9.43 p.m.—On the 16th inst. there was again great activity in the air.

The enemy's billets, which had been bombed continually for the last 24 hours, were again heavily attacked by our aeroplanes.

A total of 13 tons of bombs were dropped, our objectives including two hostile aerodromes and three large ammunition dumps, in addition to billets. At one of the aerodromes a hangar was completely burnt, and a Gotha machine which was in the act of rising from the ground was seen to crash.

The fighting was intense during the morning, but became slightly less vigorous during the afternoon. Sixteen hostile machines were brought down and seven others were driven down out of control.

Six of our machines are missing.

After dark the enemy's rest billets were again attacked by our squadrons, bombs being dropped until just after midnight, when a thick mist developed.

All our machines returned.

On the 17th inst. our aeroplanes once more raided Germany, attacking the barracks and railway station at Kaiserslautern with good results. Direct hits were observed on the railway station and a large fire was caused.

The formation was attacked by a large number of hostile machines, which were driven off.

All our machines returned.

MARCH 18th, 9.37 p.m.—On the 17th inst. good visibility enabled us to carry out even more work in the air than on previous days.

Much work was done by our artillery with observation from the air, and photography and reconnaissances by our aeroplanes were continued.

The railway sidings at Somain (about nine miles east of Douai), hostile rest billets on all parts of the front, and three of the enemy's aerodromes were all heavily bombed by us. A total of ten and a half tons of bombs was dropped on these various targets. Over one of the aerodromes attacked a fierce encounter took place, as the result of which three hostile aeroplanes were brought down.

Our own machines suffered no losses.

During the day, 18 German machines were brought down and eight were driven down out of control. A hostile observation balloon was also destroyed by us.

Four of our machines are missing.

In the early part of the night, before the mist set in, our night-flying squadrons dropped five tons of bombs on two hostile aerodromes (one of which is occupied by large bombing machines), also on a big ammunition dump north-east of St. Quentin, and on hostile billets in the neighbourhood of Douai and Menin.

All our machines returned.

#### WAR OFFICE COMMUNIQUÉS.

MARCH 12th.—The G.O.C. Palestine reports:—

During the night of March 10th . . . a further advance was made . . . Unfavourable weather prevented co-operation by our air service.

MARCH 13th.—The G.O.C., Palestine, reports:—

In the coastal sector East Anglian, South Anglian, and Indian troops attacked on a front of eleven miles.

Our Air Service co-operated, and dispersed enemy troops with bombs and machine-gun fire.

MARCH 15th.—The G.O.C. Italy reports:—

Since the last report four hostile aeroplanes have been destroyed, and one driven down out of control; in addition two enemy observation balloons have been burnt.

One of our machines is missing.

#### HOME COMMAND COMMUNIQUÉS.

MARCH 12th, 11.30 p.m.—One or two hostile airships attacked the Yorkshire coast late this evening.

A few bombs are reported as having fallen a short distance inland.

No reports of casualties or damage are yet to hand.

The raid is still in progress.

MARCH 13th.—Latest reports indicate that three enemy airships crossed the Yorkshire Coast between 8.30 and 10 p.m. last night.

Of these only one ventured to approach a defended locality, namely Hull, where four bombs were dropped. A house was demolished, and one woman died of shock.

The two remaining airships wandered for some hours over remote country districts at great altitudes, unloading their bombs in open country before proceeding out to sea again.

10.45 p.m.—One or two hostile airships attacked the north-east coast soon after 9.30 p.m. About 20 bombs have fallen close to the coast.

No reports as to casualties or damage have as yet been received.

MARCH 14th.—Only one airship crossed the coast last night and dropped four bombs in Hartlepool. The raider, which was operating at a great altitude, only remained overland for a few minutes and the remainder of its bombs appear to have fallen into the sea. Six dwelling-houses were demolished and about 30 damaged. The latest police reports state that the following casualties occurred:—

KILLED.—1 man, 1 woman, 3 children; total, 5.

INJURED.—3 men, 1 woman, 5 children; total, 9.

In a statement issued on March 12th by the Press Bureau, the total casualties caused in the air raid of March 7th are given as:

	Men.	Women.	Children.	Total.
Killed	9	8	3	20
Injured	15	28	2	45

In addition, it is feared that one body still remains buried in the wreckage of a house.



# Firth's Aircraft Steels.

|| Mark "A" Non-Magnetic  
|| Bullet-proof Plates  
|| For Armouring Aircraft.

Thos. Firth & Sons Ltd.,  
Sheffield.

# VICKERS LIMITED.

Contractors to the  
WAR OFFICE AND ADMIRALTY.

Aviation Department, Imperial Court,  
Basil Street, Knightsbridge, S.W.3.

Telephone No.—  
KENSINGTON 6810 (2 lines).



Telegraphic Address—  
VICKERFYTA, KNIGHTS, LONDON.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



It is officially announced that the total casualties caused by the airship raid on Hartlepool on the night of March 13th-14th were:—

	Men.	Women.	Children.	Total.
KILLED .....	2 .....	2 .....	4 .....	8 .....
INJURED .....	4 .....	9 .....	9 .....	22 .....

#### THE CASUALTY LIST.

Reported March 13th.

KILLED.—Orcutt, Sec. Lt. M. H., R.F.C.  
PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Potts, Lt. W. J., M.C., R.F.A., att'd. R.F.C.  
WOUNDED.—Stonehouse, Maj. E. C., A.S.C., att'd. R.F.C.  
PREVIOUSLY REPORTED MISSING, NOW REPORTED DIED AS A PRISONER IN TURKISH HANDS.—Philpott, Capt. J. R., M.C., R.F.C.  
PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER IN GERMAN HANDS.—Ball, Sec. Lt. A. C., Sher. For., att'd. R.F.C.

Reported March 14th.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN GERMAN HANDS.—Green, Lt. E. G., M.C., R.E., att'd. R.F.C.  
Rodger, Lt. K. M., Arg. and South'd Highrs., att'd. R.F.C.  
Ross, Lt. W., R. Welsh Fus., att'd. R.F.C.  
PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER IN AUSTRIAN HANDS.—Gore, Sec. Lt. F. D. C., R.F.C.

#### CANADIAN FORCES.

WOUNDED.—Ritchie, Lt. L. McC., N.B.R., att'd. R.F.C.  
Reported March 15th.  
KILLED.—Hargreaves, Sec. Lt. W. F., R.F.C.  
DIED OF WOUNDS.—Gaskell, Sec. Lt. L. N., R.F.C.

Reported March 16th.

KILLED.—Atha, Sec. Lt. L. E., R.F.C.  
PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Campbell, Capt. J. S., Arg. and Suthd. Highrs., att'd. R.F.C.  
Hutton, Sec. Lt. W. W., Lond. R., att'd. R.F.C.  
DIED OF WOUNDS.—Fear, Sec. Lt. R. S., Worc. R., att'd. R.F.C.  
WOUNDED.—Drummond, Lt. M. D. G., R.F.C.  
Herbert, Sec. Lt. L. A., R.F.C.  
MISSING.—Montgomery, Capt. K. B., M.C., R.F.C.  
Poulter, Sec. Lt. W. F., R.F.C.  
Reade, Sec. Lt. A. B., R.F.C.

#### CANADIAN FORCES.

WOUNDED.—Southwell, Lt. L. V., Sask. R., att'd. R.F.C.  
MISSING.—Gilmour, Lt. A. C., Man. Regt., att'd. R.F.C.  
Haight, Capt. W. L., W. Ont. Regt., and R.F.C.  
PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER IN GERMAN HANDS.—Beattie, Lt. J. O., B.C. Regt., att'd. R.F.C.

Reported March 18th.

KILLED.—Clements, Sec. Lt. D. M., R.F.C.,  
Mackay, Lt. H. W. M., Gord. Highrs., att'd. R.F.C.  
Morris, Lt. J. H., R.H.A., att'd. R.F.C.  
PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—  
Edwards, Sec. Lt. A. W., R.F.C..  
Hood, Sec. Lt. R.P., R.F.C.  
WOUNDED.—Boston, Sec. Lt. W. H., R.F.C.  
Cave, Lt. T. W., R.F.A., att'd. R.F.C.  
Doble, Sec. Lt. A. J. S., R.F.C.  
Jones, Sec. Lt. L. N., R.F.C.  
Jones, Sec. Lt. S., R.F.C.  
Morris, Lt. N. G., R.F.A., att'd. R.F.C.  
Virgo, Sec. Lt. C. P., R.F.C.  
MISSING.—Duke, Lt. R. E., R.F.C.  
Hancock, Lt. H. L. W., R.F.C.  
Sisley, Sec. Lt. L. D., R.F.C.  
Wigan, Sec. Lt. A. P. C., R.F.C.  
PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONERS IN GERMAN HANDS.—Alderson, Sec. Lt. A. G. D., Worc. A., att'd. R.F.C.  
Clemons, Sec. Lt. H. S., A.S.C., att'd. R.F.C.  
Cudmore, Sec. Lt. E. O., R.F.C.  
Hewitt, Sec. Lt. H. A., R.F.C.,  
Swart, Sec. Lt. O. B., R.F.C.

#### AUSTRALIAN FORCE

ACCIDENTALLY KILLED.—Dealy, Lt. T. S. O., Aust. Fl. Corps.  
Reported March 19th.  
KILLED.—Hancock, Sec. Lt. J. M., R.F.C.  
Mellish, Sec. Lt. R. T., R.F.C.  
PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—Minot, Capt. L., R.F.C.  
PREVIOUSLY REPORTED WOUNDED, NOW REPORTED DIED OF WOUNDS.—Ashton, Lt. H. G., Lond. R., att'd. R.F.C.  
ACCIDENTALLY KILLED.—Lay, Sec. Lt. H. F. D., R.F.C.  
Watson, Sec. Lt. G. W. A., R.F.C.  
MISSING.—Butler, Sec. Lt. H., R.F.C.

#### CASUALTIES AMONG MEN.

THE DATES ARE THOSE OF THE OFFICIAL LIST.

#### ACCIDENTLY KILLED.

March 6th.—R.F.C.—Brooks 121198 3rd Cl Air Mech. M. (Thorpe, Norwich).

#### DIED.

March 7th.—R.F.C.—Pearce 77347 2nd Cl. Air Mech. L. R. (Kidderminster).  
March 8th.—Paterson 105890 3rd Cl. Air Mech. J. (Alloa).  
PREVIOUSLY REPORTED MISSING, BELIEVED DROWNED, NOW REPORTED DROWNED.  
March 7th.—R.F.C.—Hunt 90142 3rd Cl. Air Mech. J. A. (Lambeth, S.E.).

#### WOUNDED.

March 6th.—R.F.C.—Ayres 61183 1st Cl. Air Mech. F. (Reading); Williams 65712 2nd Cl. Air Mech. I. (Llandudno).  
March 8th.—Dunn 54980 3rd Cl. Air Mech. J. (Bath); Hodges 8361 1st Cl. Air Mech. W. G., M.M. (Street, Somerset).  
MISSING.  
March 6th.—R.F.C.—Paterson 20798 2nd Cl. Air Mech. A. (Dundee).  
March 8th.—Bain 107299 1st Cl. Air Mech. L. J. W. (Brixton, S.W.).

#### PERSONAL NOTICES.

##### ENGAGEMENT.

SELBY—BARTRUM.—An engagement is announced between Capt. J. G. Selby, M.C., R.F.A., R.F.C., only son of Mr. and Mrs. H. T. Selby, Northfield, Bromley, Kent, and Dorothy, younger daughter of Mr. and Mrs. S. Bartrum, Coniston, Bromley, Kent.

##### MARRIAGES.

ALCOCK—PULLMAN.—On Dec. 1st, 1917, at Slough, Lt. John Forster Alcock, R.F.C., son of the late John Forster Alcock and of Mrs. Alcock, Northchurch, Berkhamsted, was married to Marian Winifred, only daughter of Mr. and Mrs. Arthur Pullman, of Moscow.

BILLINTON—RYGATE.—On March 11th, at Bath, Lt. H. L. Billinton, R.F.C., youngest son of the late Robert J. Billinton and Mrs. Billinton, of Lea Hurst, Withdean, Brighton, was married to Minnie, youngest daughter of the late Robert Rygate, Wellington, N.S.W., and sister of Mrs. Holland, Benhall Lodge, Saxmundham, Suffolk.

DANIEL—THOMAS.—On the 5th inst., at Welsh Presbyterian Church, Charing Cross, W., by the Rev. P. H. Griffiths, Sec. Lt. G. S. Daniel, R.F.C., son of the late Mr. D. L. Daniel, was married to Margaret, eldest daughter of Mr. J. Thomas, of Denbigh, North Wales.

HENDERSON—CRAIG.—On March 4th, at Winterbourne-Stoke, Wilts, Capt. Malcolm Henderson, D.S.O., Seaforth Highlanders and R.F.C., second son of the late Lessels Henderson, and Mrs. Henderson, 36, Howitt Road, Belsize Park, N.W., Elizabeth, daughter of Frederick Craig, of St. Columb, North Cornwall.

PATON—BRAHAM.—On March 2nd, at St. Mary's Church, Southampton, Lt. Harry Arthur Paton, R.F.C., son of the late Edward Lonsdale Paton, of St. James's, Piccadilly, W., and Perth, Scotland, was married to Dorothy Marion, daughter of the late Philip Braham, F.R.S., and Mrs. Foster-Welch, Southampton, by the Rev. Canon Neville Lovett, Hon. Chaplain to H.M. the King.

##### BIRTHS.

LEE.—On March 15th, at 34, Albert Road, Regent's Park, the wife of Major M. G. Lee, Indian Army (att'd. R.F.C.)—a daughter.

SWEENEY.—On March 13th, at 28, Carill Drive, Fallowfield, Manchester, the wife of Lt. Ronan Linley Sweeney, Lanc. Fus., att'd. R.F.C.—of a daughter.

WAINWRIGHT.—On March 13th, at 159, Harlaxton Road, Grantham, to Violet Myfanwy, wife of Capt. C. B. Wainwright, R.F.A. and R.F.C.—a son.

If any returned prisoner from Germany can give any information as to the whereabouts of Sec. Lt. Gavern B. Roberts, R.F.C., who has been missing since Sept. 25th, 1917, and not heard of since, the information will be gratefully received by Percy Roberts, Tenterden House, Connaught Avenue, Loughton, Essex.

\* \* \*

Capt. W. G. Pender, M.C., R.F.C., was reported missing on Aug. 15th, 1917. Will friends of prisoners of war in Germany (especially R.F.C. prisoners of war) request information of the above-mentioned officer for his mother, Mrs. Pender, Onich, Bookham, Surrey, who will be most grateful for any particulars whatever?

[PRESSURE ON SPACE HAS MADE IT NECESSARY TO HOLD OVER ALL OBITUARY NOTICES THIS WEEK.]





# ARMSTRONG, WHITWORTH

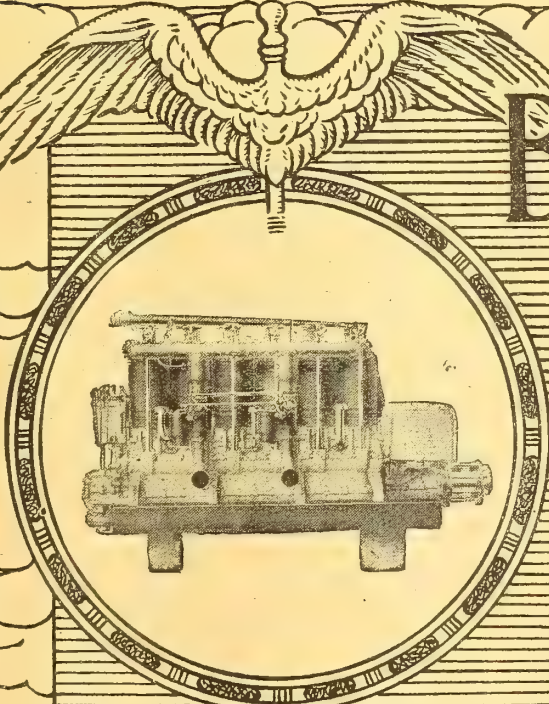
## AIRCRAFT WORKS,

### NEWCASTLE ~ UPON ~ TYNE.



TELEPHONE :- 500 GOSFORTH.

TELEGRAMS :- ARMSTRONG AVIATION,  
NEWCASTLE ~ ON ~ TYNE.



# BEARDMORE

# AERO

# ENGINE

The Name which guarantees  
**EFFICIENCY** and  
advanced design.

The BEARDMORE AERO ENGINE Ltd.  
London Showrooms and Depots:  
112, GT. PORTLAND STREET, LONDON, W.1.  
Telephone: Gerrard 238.

C.D.C.



## FRANCE.

## OFFICIAL COMMUNIQUÉS.

MARCH 12th.—A German machine was brought down during the night of March 11th-12th by the fire of our special guns. The machine fell to the north of Soissons. The three occupants, of whom two were officers, were taken prisoners.

During the day of the 11th three German machines were brought down by our pilots and a fourth was badly damaged.

Last night three other enemy bombarding aeroplanes were brought down by the fire of our anti-aircraft guns.

A warning was given in Paris at 9.10 p.m. on the night of March 11th-12th, and the "All clear" at midnight.

According to the first reports, about 60 enemy aeroplanes succeeded in crossing our lines. Thanks to the artillery barrages, which were maintained throughout the entire raid with great intensity, a certain number of machines were unable to reach their objectives. Nevertheless, numerous bombs were thrown on Paris and its suburbs. Several buildings were demolished or set on fire.

The number of victims is not yet known, and will be published as soon as further reports have been received.

4.30 P.M.—The following casualties are reported:—PARIS.—Killed, 29; injured, 29. THE SUBURBS.—Killed, 5; injured, 29.

In addition, 66 persons were asphyxiated in the crowd during a panic which occurred at the entrance to a refuge in the Metropolitan Railway. Most of these were women and children.

A hospital was particularly badly struck, six people being killed and seven wounded there. Bombs fell at comparatively few points both in Paris and in the outskirts.

A large number of enemy aeroplanes were forced to turn back by the artillery barrage, and continued dropping their bombs in the suburbs for a considerable distance after they had left.

One of the three Gothas brought down was reduced to ashes by fire and the pilot and other occupants were burned to death. Most of the crews of the other machines brought down were wounded.

MARCH 12th.—ARMY OF THE ORIENT.—The Allied Air Services carried out numerous bombardments of the enemy's establishments in the region of Rupel and north of Monastir.

MARCH 13th.—Yesterday (Tuesday) a German machine was brought down and three others fell in their own lines in a badly damaged condition.

On the 11th Serjt.-Maj. Garraud accounted for his 10th enemy.

MARCH 14th.—During the day three German machines were brought down by our pilots.

It is confirmed that on the 9th Sub-Lieut. Madon brought down two German aeroplanes.

Our bombarding aeroplanes carried out several raids. Explosive bombs weighing 9,800 kilos (about 2½ tons) were dropped on railway stations and aerodromes in the enemy zone.

There was artillery activity on the right of the Vardar and to the north-west of Monastir.

Numerous bombardments were carried out by Allied aviators on the Seres-Drama line, on enemy dumps in the Vardar Valley, and on the railway station of Beranci, north of Monastir.

It is reported that Lt. Mezergues, the French specialist in long-distance air bombing, who has been a prisoner in Germany since October, has escaped, and has reached Holland.

MARCH 15th.—5,640 kilogrammes (over 5½ tons) of projectiles were dropped last night (Thursday) on a number of railway stations, factories, and cantonments in the enemy zone.

The casualties in the panic at the Metropolitan Railway during the raid on March 11th were 70 killed and 71 injured.

MARCH 17th.—During the daytime on March 15th a German aeroplane was brought down by our pilots and four others were seriously damaged.

Our bombing machines dropped 7,000 kilogrammes (about seven tons) of projectiles on enemy military establishments and behind the front.

In the course of the 16th our pilots destroyed two German aeroplanes. Four other enemy machines fell in their lines as the result of fighting.

It is confirmed that four fresh German machines were brought down on Wednesday and Friday.

MARCH 18th.—In the course of yesterday (Sunday) three German aeroplanes were destroyed and six others seriously damaged by our pilots. Besides these, a German captive balloon was set on fire by one of our aviators.

It is confirmed that two other German machines were brought down on March 15th and 16th.

Our bombers dropped 6,000 kilogrammes (about six tons) of explosives in the course of the day and during the night of the 16th, and 5,000 kilogrammes (about five tons) on the 17th on enemy establishments, cantonments, and railway stations.

ARMY OF THE ORIENT.—Allied aviators dropped more than 1,900 kilogrammes (nearly two tons) of explosives on the enemy's establishments in the Struma and Vardar valleys and towards Resna. Important results were observed.

## GERMANY.

## OFFICIAL COMMUNIQUÉS.

MARCH 12th.—This afternoon Allied aeroplanes attacked Coblenz. Some slight material damage was caused, but no military damage. Five persons were killed and twenty more or less seriously injured.

MARCH 12th.—Lt. Baron von Richthofen achieved his 17th aerial victory.

In retaliation for the enemy aerial attacks on March 9th and 10th on Stuttgart, Esslingen, Unter Türkheim, and Mainz, our aviators last night copiously and successfully bombed Paris.

MARCH 13th.—Strong reconnoitring activity in the air led to violent fighting. We shot down yesterday 19 enemy aeroplanes and two captive balloons.

Cavalry Capt. Baron von Richthofen achieved his 64th and Lt. Baron von Richthofen his 28th and 29th aerial victories.

MARCH 13th.—On the night of March 12th one of our naval airship squadrons attacked fortified places and military establishments on the Humber and in Yorkshire with good results. The airships encountered severe artillery fire, which, however, was unable to stop the attack. All our airships returned undamaged. Capt. Strasser was again in command.

MARCH 14th.—Yesterday [Wednesday] 17 enemy aeroplanes and three captive balloons were brought down during aerial engagements and by fire from the earth.

Of an enemy squadron flying towards Freiburg three machines were brought down on the front.

Rittmeister Freiherr von Richthofen achieved his 65th aerial victory.

MARCH 15th.—In conjunction with a patrol trip over the North Sea one of our naval airships under Commander Dietrich on Wednesday night successfully bombed the harbour and industrial works of Hartlepool. In spite of the enemy's defensive action, which at times was strong, the airship suffered no damage whatever.

During February the enemy made 23 air attacks on the German Homeland, 13 of which were directed against industrial districts in Lorraine, Luxemburg, and in the valleys of the Saar and the Moselle. These 13 raids caused no interruption of work, and, in the majority of cases, the enemy aeroplanes did not reach our works, thanks to our anti-aircraft guns. Of the remaining ten attacks, three were directed against Trèves, and one each against Saarbrücken, Mannheim, and Pirmasens.

The enemy was unable to cause any military damage, but the damage to houses and private property was in many cases not inconsiderable. Twelve persons altogether were killed, 15 severely and 21 slightly wounded. One enemy biplane fell into our hands.

MARCH 17th.—Seventeen enemy aeroplanes and two captive balloons were shot down yesterday as the result of aerial encounters and by fire from the ground.

MARCH 18th.—On the whole front there was very lively aerial activity. French aviators dropped bombs on the hospital establishments at Le Thour (22 miles north-north-east of Reims), which were clearly recognisable as such.

Yesterday we shot down 22 enemy aeroplanes and two captive balloons. Lieut. Kroll achieved his 21st aerial victory.

In February the losses of the enemy aerial forces on the German front amounted to 18 captive balloons and 138 aeroplanes; 59 of these behind our lines. The remainder were seen to fall beyond the enemy positions. In aerial fights we lost 61 aeroplanes and three captive balloons.

\* \* \*

"Kölnische Zeitung" of March 17th publishes an interview with the General in supreme command of the German aerial forces, in the course of which he said:—

"It is true that the aerial attacks on Paris on the nights of January 30th-31st, March 8th-9th, and March 11th-12th had no direct military aims in view, and that they also were not directed against the fortress, but against the City of Paris. The French have no reason to be indignant, as these attacks were a punishment for the enemy's attacks last Christmas Eve and in January, and also for those again undertaken in spite of these warnings in February against open towns in Germany situated far outside the region of military operations. It is only the sign of a guilty conscience when the entire French Press suppresses this fact."

After again emphasising the fact that these attacks on Paris were only carried out after repeated warnings, the General asserted:

"Hitherto our air attacks have been exclusively directed against such targets as were directly connected with military activities at the front. Moreover, we have repeatedly requested our enemies to indicate all cases where open towns outside the region of operations have been attacked by our bombing squadrons, but they have returned no answer. Although the majority of the enemy's attacks against open German towns were without effect thanks to our defensive measures, some of them have inflicted heavy sacrifices upon us."



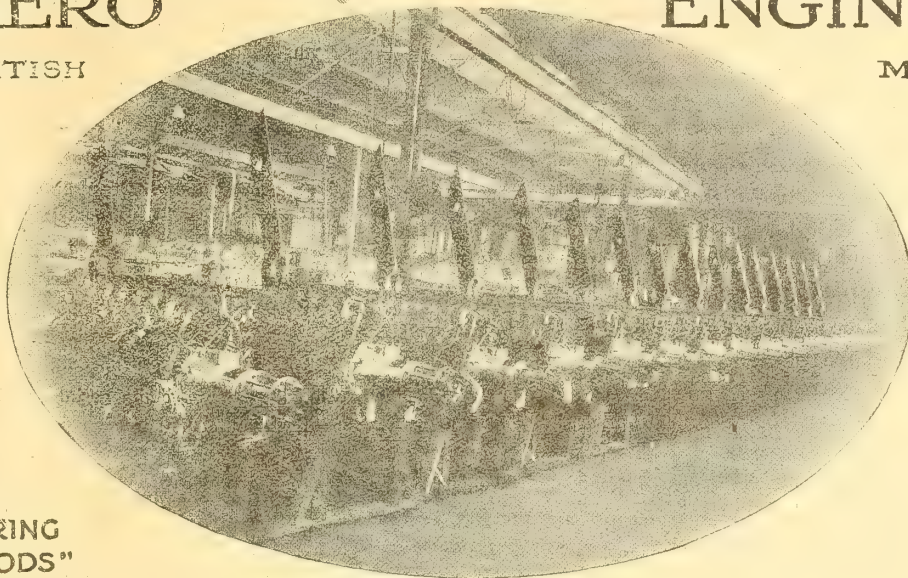
**NAPIER**

**AERO**

BRITISH

**ENGINES**

MADE



"DELIVERING  
THE GOODS"

**D. NAPIER & SON LTD.**

Works:-  
ACTON LONDON W.

**MOTORS**

14 NEW BURLINGTON ST  
LONDON W.

**GWYNNE**  
LIMITED

CONTRACTORS TO H.M. ADMIRALTY AND WAR OFFICE.

SOLE LICENSEES AND MANUFACTURERS IN THE BRITISH EMPIRE  
OF THE

**"CLERGET" PATENT AERO ENGINES.**



WORKS & OFFICES: { CRISP ROAD, HAMMERSMITH, W.6, } LONDON.  
                              { CHURCH WHARF, CHISWICK, W.4, }

TELEPHONES: 1910 HAMMERSMITH (3 lines).  
                  1780 CHISWICK 3 lines).

TELEGRAMS: "GWYNNE, LONDON."

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



In this connection the General referred to the attack on Karlsruhe on Corpus Christi Day in 1916, and concluded:—

"We are now waiting to see whether the French Government will take these severe penalties to heart, as it remains entirely in their hands as to whether or not the City of Paris has to suffer from further air attacks by us."

\* \* \*

"Lokalanzeiger" of March 17th reports that the well-known aviator Capt. Baron von Tutschek has been killed in an air fight behind the German lines. Twenty-seven victories were claimed for him.

#### ITALY.

##### OFFICIAL COMMUNIQUÉS.

MARCH 12th.—During yesterday our artillery showed increased activity against the enemy rear lines on the Tonezza Plateau (west of the Astico), and on that of Asiago. Hostile battery positions were also engaged with visible good effects on the left bank of the Piave. In the Astico Valley and to the east of the Brenta there was rather lively artillery fire on the side of the enemy.

The usual activity of our reconnaissance parties caused the exchange of rifle fire along some portions of the front.

Five enemy aeroplanes were shot down, one by our own aviators above Mt. Erio (south-western edge of Sette Comuni), three by British aviators to the west of Mt. Lissar (Asiago Plateau), and one by the French anti-aircraft batteries near Pederobba (on the Piave at entrance to plain). Our airships renewed last night the bombardment of the aviation grounds of the enemy.

MARCH 13th.—On the plains aerial activity was remarkable on the fighting lines and on the immediate rear lines. During the day the seaplanes of the Royal Navy dropped bombs on enemy stores, and during the night the aviation grounds of the enemy were bombed by our airships. An enemy aeroplane, shot down by one of our aviators, fell on the left side of the Piave.

MARCH 17th.—British aviators shot down an enemy machine to the east of the Montello. Last night our airships dropped two tons and a half of bombs on one of the enemy aviation grounds west of the Livenza.

MARCH 18th.—On the 17th (216th) inst. one of our aviators brought down an enemy machine on the right side of the Piave. Yesterday four more hostile aeroplanes were shot down by our aviators respectively to the east of Mt. Grappa, in the Seren Valley (Grappa front), south of the Col d'Asiago, and east of Conco (both west of the Brenta).

Last night one of the airships of the Royal Navy dropped bombs on an aviation ground of the enemy on the Livenza.

\* \* \*

Two American aviators, Major Ryan, pilot, and Capt. Frost, observer, arrived at Rome on March 15th on a S.I.A. machine, having flown from Foggia, stopping only once—namely, at Naples—and covering 340 kilometres (about 212 miles) in 2 hours 38 minutes.

\* \* \*

The correspondent of the "Times" writes on March 13th from Rome that it is announced that the commanders of the anti-aircraft defence of Naples, Foggia, and Hermoli have been deprived of their commands on grounds of negligence and inaction in connection with the air raid on Naples. An inquiry is to be held.

\* \* \*

The "Messaggero" correspondent at the front reports on March 13th that a squadron of enemy aeroplanes, while flying over Italian positions, dropped manifestoes urging the futility of further Italian resistance. Italian and English aeroplanes went up immediately and attacked the enemy machines, four of which were destroyed.

The following semi-official statement was issued in Rome on March 15th:—

"At 10 p.m. yesterday two enemy airships were observed coming from the direction of the Vesuvius 'massif' and flying towards Naples. All means of defence were at once put into action and prevented the enemy from flying over the city, which was not damaged."

#### BULGARIA.

##### OFFICIAL COMMUNIQUÉ.

MARCH 15th.—South of the Belasitza mountains our artillery brought down two enemy aeroplanes, one of which fell behind our lines north of Lake Butkovo (Struma front). The pilot, an Englishman, was taken prisoner.

#### BELGIUM.

##### OFFICIAL COMMUNIQUÉS.

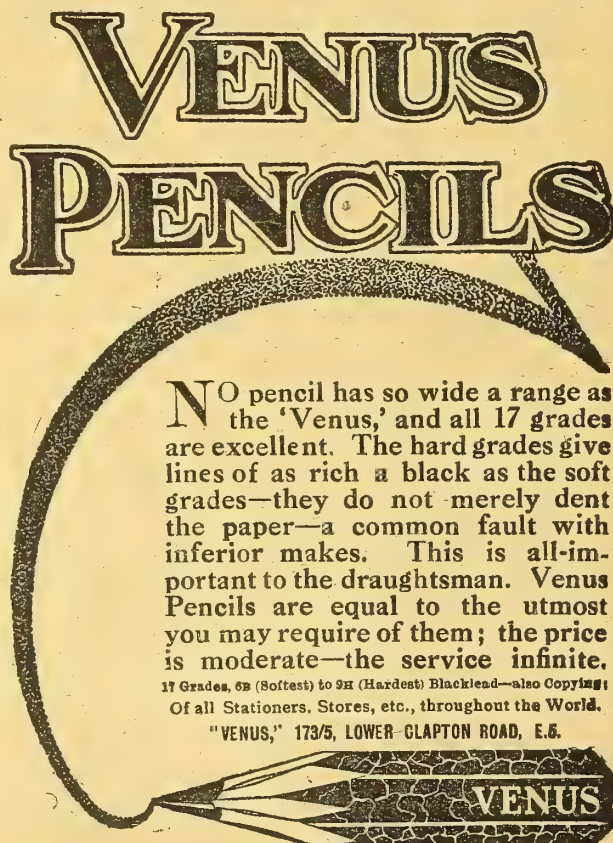
MARCH 17th.—Adjutant de Meulemeester this morning brought down his eighth machine above Dixmude.

There were frequent aerial fights during the week, in which one German aeroplane was shot down and several others forced to land within their own lines.

#### TURKEY.

##### OFFICIAL COMMUNIQUÉ

MARCH 8th.—There was lively aerial activity.



**VENUS PENCILS**

NO pencil has so wide a range as the 'Venus,' and all 17 grades are excellent. The hard grades give lines of as rich a black as the soft grades—they do not merely dent the paper—a common fault with inferior makes. This is all-important to the draughtsman. Venus Pencils are equal to the utmost you may require of them; the price is moderate—the service infinite.

17 Grades, 6B (Softest) to 9H (Hardest) Blacklead—also Copying.  
Of all Stationers, Stores, etc., throughout the World.

"VENUS," 173/5, LOWER CLAPTON ROAD, E.8.

**VENUS**

## AIRCRAFT COMPONENT PARTS & FITTINGS

FOR ALL TYPES OF MACHINES.

CONTROLS, EYEBOLTS, FINS, RADIATOR SHUTTERS, RUDDERS, TAIL PLANE ADJUSTING GEARS, TAIL SKIDS, TANKS, WIRING PLATES, A.G.S. BOLTS, CASTINGS & METAL FITTINGS of all descriptions.

MANUFACTURED BY

**The Snercold Engineering Co., Ltd.,**  
**HAMPTON WICK, MIDDX.**

Telephone: 1153 and 1154, KINGSTON.

Telegrams: "SNERCOLD," KINGSTON-ON-THAMES.



# LODGE

## AERO PLUGS

The world's best.

*Illustrated  
Catalogue  
on  
application.*



*Complete Output reserved for  
British and Allied Governments.*

MADE IN ENGLAND  
by  
THE LODGE SPARKING PLUG CO., LTD.  
RU. BY.

# THOMAS ROBINSON & SON, LTD ROCHDALE, ENG.

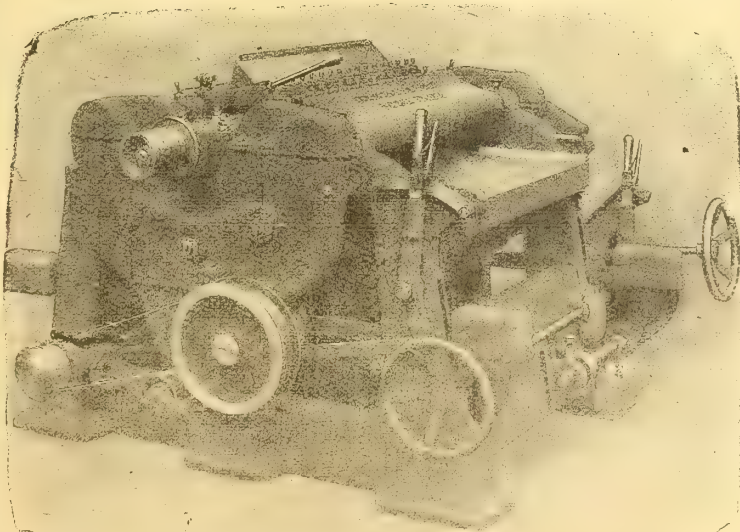
## AIRCRAFT MACHINERY.

**Panel Planing & Thicknessing  
Machines for High-class Work**

With Flexible Feed Roller and  
Chip Breaker, Tables on Inclined  
Slides and Patent Variable Feed  
Gear.

**TYPE MZ.**

*Write for particulars.*





**HOLLAND.**

It is officially announced from Amsterdam on March 7th that the German Government has expressed to the Dutch Government its deep regret at the falling of a bomb from a German aeroplane in Dutch territorial waters on the occasion of the arrival of the British convoy on Feb. 27th.

The bomb, it is added, broke loose from the aeroplane when the aviator observed that he was over Dutch territorial waters, and turned quickly in order to change his course.

**U.S.A.**

A message from New York on March 14th states that the newspapers announce that America's first seaplane to be equipped with the new Liberty motor has undergone successful trials, and has been accepted. A number of these new craft are being delivered for submarine hunting, and a large fleet is expected to be ready soon for use in the submarine zones.

\* \* \*

The special correspondent of the Agence Havas at the American front telegraphs on March 17th that Mr. Baker, the United States Secretary for War, after having visited an American aviation centre, made the following statement:—

Just before I left America I made inquiries as to how our aviation programme was progressing. I found our manufacturers full of enthusiasm as to the results. When they hear of the preparations which have been made in France to utilise the material they are sending over they will have a new incentive to speed up their efforts. In fields where not a single building existed when we laid our first rail, a city of barracks, offices, stores, and sheds has grown up, the whole forming a training school for aviation. In this, as in all our other preparations in France, our aim has been to bring help to the French and British proportionate to our means, and with them to gain the absolute mastery of the air, which is one of the first conditions, if not the first condition, requisite for victory.

A Reuter's message from Washington, dated March 18th, states that Mr. Daniels, Secretary for the Navy, has asked Congress for an appropriation of 188,000,000 dollars, double the sum originally proposed, for expenditure in connection with the Naval Air Service during the fiscal year. Mr. Daniels declared that recent war developments necessitated the granting of the larger sum.

**TERRY**

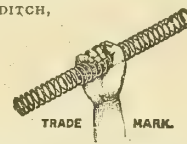
**Cable  
Coverings  
and  
Complete  
Controls**

**—of reliableness**

**FOR WAR PURPOSES.**

**C**ONTROL WIRES are of great tensile strength, and the covering is a flexible tenacious material—that is one colour all thro'—**QUITE DAMPROOF**—and made up in any colour. If desired cables may be armoured—making them fireproof also.

HERBERT TERRY & SONS, Ltd,  
The Spring & Presswork Specialists  
REDDITCH,  
Eng.



(2)

**Bowden  
Wire Ltd.**

**LONDON**

VICTORIA ROAD  
WILLESDEN JUNCTION, N.W.10

Victoria Road, Willesden Junction, N.W.10.

**B**EING wholly engaged upon production for the British and Allied Governments, we regret that we are unable for the present to execute any orders for private purposes.

**AIRCRAFT DEPARTMENT**

THE WORLD'S LARGEST MANUFACTURERS OF ALL KINDS OF ENGRAVED METAL GOODS

**British Metal (Kingston) Ltd.**

*The Factory,*

**Kingston-on-Thames**

**DIALS & INSTRUCTION PLATES**  
MADE IN ANY METALS,  
IVORY, IVOROID, BONE, ETC.  
ANY QUANTITIES, WORDING, DESIGN,  
SIZE, SHAPE OR COLOURS.

**COMPLETE SHEET METAL  
AIRCRAFT COMPONENTS**  
RIVETED, SWEATED, BRAZED OR WELDED.  
**R.E., F.E., B. & D, B.E., C-D-E,  
SE, DE H.**

**RESIDENT A.I.D. EXAMINER.**



**PIONEERS**  
in aircraft design  
and construction

# **Blackburn**

## **AIRCRAFT**

The  
BLACKBURN AEROPLANE  
AND MOTOR CO., Ltd.,  
Olympia, LEEDS.

Contractors to the  
Admiralty and War Office.

**"Always at the Front!"**

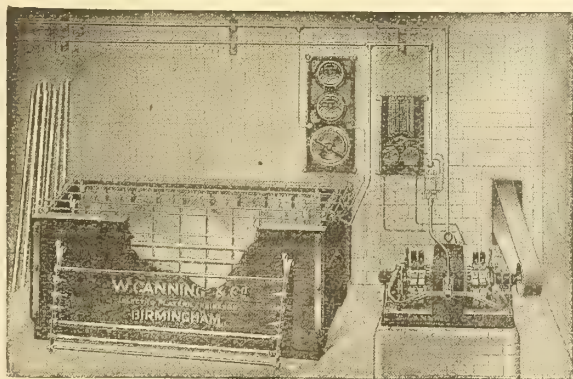
*Steele's Ad. Serv.*

## **W. CANNING & CO.** *Lustre Works,* *...Gt. Hampton Street* **BIRMINGHAM**

AND 18/20, ST. JOHN'S SQUARE,  
CLERKENWELL, LONDON, E.C.1.

### **MANUFACTURERS OF**

Motor Generators, Low Voltage Dynamos, Vats,  
Chemicals, Complete Plant for,  
**ELECTRO - ZINCING (COLD GALVANIZING)**

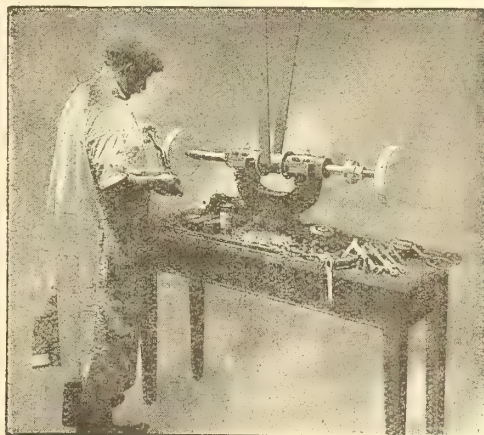


For Aeroplane Stay Wires, Connections.

**Also NICKEL, COPPER AND BRASS  
PLATING AND TANNING, &c., OUTFITS.**

Contractors to the British, Colonial, and Foreign  
Governments, Railways and Shipyards.

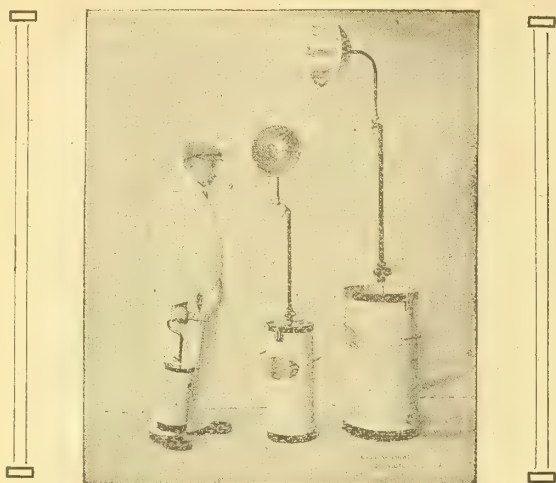
**POLISHING MACHINERY & MATERIALS  
FOR AERO ENGINE & OTHER PARTS.**



**POLISHING LATHES**, with Self-Oiling and  
Ball Bearings. EMERY GRINDERS, POLISHING  
MOPS, POLISHING BOBS, POLISHING COM-  
POSITIONS, "LUSTRE" POLISH.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





Large numbers of these three types have been supplied.

## IMPERIAL LIGHTS — FOR — AERODROME LIGHTING

IMPERIAL LIGHT LTD.,

123, Victoria Street,

LONDON,

S.W.1.

Telegrams—  
"EDIBRAC,  
PHONE,  
LONDON."

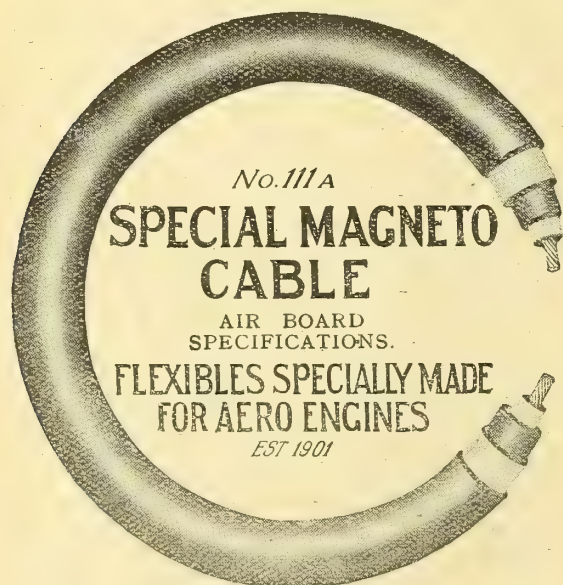
Telephone—  
VICTORIA  
3540  
(3 Lines)

## LIGHT STEEL STAMPINGS for AEROPLANES

Any size or weight :  
Rough or Machined:  
Single piece or Com-  
bination pressed and  
welded by Oxy-  
acetylene and other  
processes.

JOSEPH SANKEY & SONS, LTD.,  
— Haeley Castle Works, Wellington, Shropshire. —

## ELECTRIC CABLES



No. 111A

### SPECIAL MAGNETO CABLE

AIR BOARD  
SPECIFICATIONS.

FLEXIBLES SPECIALLY MADE  
FOR AERO ENGINES

EST 1901

**E. KALKER & CO.,**  
COVENTRY.



## Aeroplane Construction

In aeroplane construction the vital factor is "how many machines can be turned out in a given time." This depends entirely upon the efficiency of the machinery employed. And no machine reaches its highest point of production until its clutches, brakes, etc., are fitted with Ferodo Fabric.

Ferodo Fabrics are the most efficient transmitters of energy. Leather, wood, textile beltings, etc., are out of date for Friction drives and Braking purposes. The moment they become soaked with oil they are useless; Ferodo Fabrics never slip, never seize; are not affected by water, oil or acid, and are absolutely reliable under all conditions.

**THE HERBERT FROOD CO. LTD.**

Works: CHAPEL-EN-LE-FRITH.

Contractors to the War Office and Admiralty, London General Omnibus Company, and Underground Electric Railways of London and Paris.

Depots at London, Birmingham, Belfast, Bristol, Cardiff, Edinburgh, Glasgow, Liverpool, Manchester & Newcastle.

**FERODO**  
Friction Surfaces

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



*Of special  
interest to Government  
Contractors.*

**J.B. BROOKS & CO. LTD.**

Contractors to the Admiralty, War Office,  
Air Board, Ministry of Munitions, etc.  
And the Leather Specialists with  
the Largest Works, Finest  
Equipment, Best Facilities, and  
widest experience in the Trade,  
invite enquiries for Articles,  
Parts, Fitments, and Cases of

**LEATHER**

*J.B. Brooks & Co. Ltd.  
104 Criterion Works  
Birmingham.*

1131

THE  
**Eastbourne Aviation Co. LTD.**

ESTABLISHED 1911

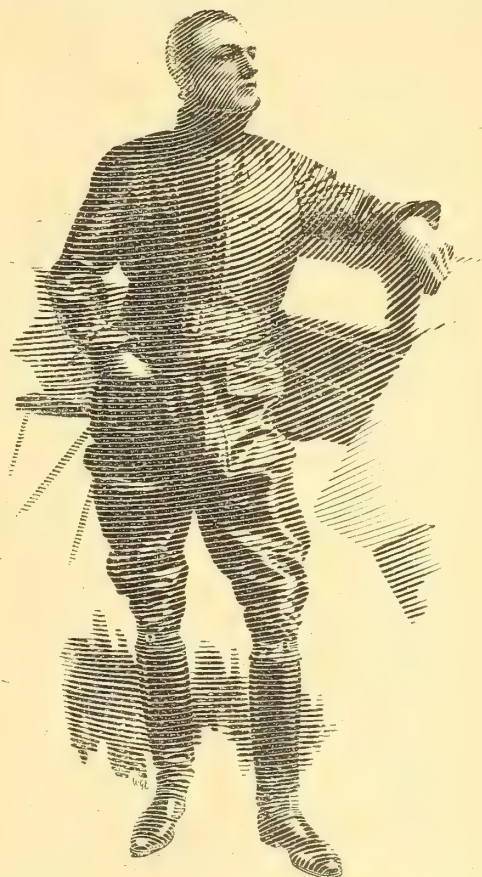
THE EASTBOURNE AVIATION CO. LTD.

**AEROPLANE CONSTRUCTORS**  
Contractors to the Admiralty

THE SOCIETY OF BRITISH AIRCRAFT CONSTRUCTORS

TELE { GRAMS: Aircraft } EASTBOURNE  
PHONE: 1176

*Where Flying Men are fitted out.*



**"All our Machines Returned Safely"**

BALD official phrase, read by the man in the street with a joy none the less deep for his imperfect realisation of what it implies.

Not a single cold-benumbed hand failed at the controls, no eye or brain was so dulled with bodily misery that the faint grey smudges below lost their meaning as bearings.

He, the Airman, alone knowing what these dark and perilous excursions mean—he it is who alone realises the vital urgency of securing the world's best flying kit. He is the man you meet at *Dunhills*.

It weighs with him that *Dunhills'* experience in air-kit making—and that goes both to the infancy of flight—is backed by an earlier (and a long and distinguished) experience in the kindred problem of kit-making for motorists.

**LEATHER COMBINATION SUIT**

*Lined soft, snug camel fleece.*

To knee. To ankle.

Tan Leather 9 gns. 10 gns.

Black " 10 " 11 "

Made with Map and other deep, useful pockets.

The Aviation Catalogue gives the res of the kit, so send a card for a copy.

**Dunhill's**  
LIMITED.

2, Conduit Street, London, W. 1.

MANCHESTER:  
90 and 92, Cro s Street.

GLASGOW:  
72, St. Vincent Street.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



**BUY**  
**Your Streamline Wires.**  
 FROM  
**THE ORIGINAL MAKERS**  
**BRUNTONS**  
**MUSSELBURGH,**  
**SCOTLAND.**

We can supply Wires, plain,  
 screwed or fitted with Fork or  
 Universal Joints.

# Bowden

**BOWDEN**  
**CONTROLS**  
 AND  
**BOWDEN CABLES**  
 FOR ALL  
**AEROPLANE**  
**PURPOSES.**

Quotations on application.

Note Address—

**The BOWDEN BRAKE**  
**Co., Ltd., Tyseley,**  
**B'HAM.**



# Tyseley

R.F.S.

**HIGH-CLASS**  
**ALUMINIUM**  
**CASTINGS**

**FOR ALL TRADES.**

We Specialise in Aluminium Cylinders and  
 General Aero and Motor Engine Castings,

**CAST IRON**  
**CYLINDERS**

Water and Air-cooled for Aero & Motor Engines

ALL THE ABOVE CASTINGS  
 TO GOVERNMENT SPECIFICATION.

**WILLIAM MILLS, LTD.,**  
 Atlas Works :: Grove Street,  
**BIRMINGHAM.**  
**ALUMINIUM AND IRON FOUNDERS.**

THE USE OF

**NAYLOR'S**  
**Aero Varnishes**

**WILL ENSURE A**  
**PERFECT FINISH**

Many years' experience  
 combined with up-to-date  
 methods and scientific se-  
 lection of materials ensure  
 the production of var-  
 nishes unexcelled for  
 durability and reliability.

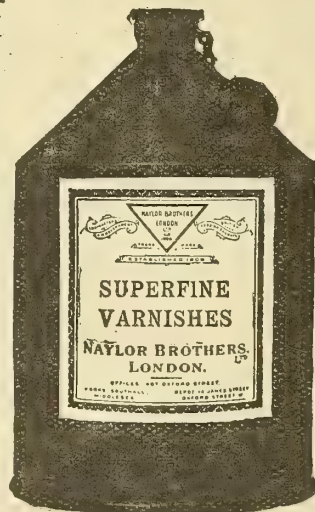
**Some Specialities**  
**for Aero Work**

Woodfillers, Stains, Air  
 Screw Varnish, Spar  
 Varnish, Float Varnish,  
 White Copal Finish for  
 Dope, Enamels, Engine  
 Paints, Etc., Etc.

Free Samples for trial  
 on application.

**NAYLOR BROTHERS (London) Ltd.**  
 Contractors to all Government Departments.

Offices: 407/9, OXFORD S... Works: SOUTHALL  
 LONDON, W. MIDD.





# Aeroplane General Sundries, Ltd.

Manufacturers of  
AEROPLANE & AERO  
ENGINE FITTINGS

## A.G.S.

Bolts  
a  
Speciality

All kinds of small turning and repetition work undertaken at short notice.

- A.I.D. INSPECTION AT WORKS. -

Telephone—  
Holborn 4959.

Telegrams—  
Zeppishout.  
Holborn,  
London.

Registered Office—

FULWOOD HOUSE,  
FULWOOD PLACE,  
HIGH HOLBORN,  
LONDON, W.C.



## Suits Aviation

THE  
"Air-Velope"

Built up on entirely new scientific lines.

The details of which we shall make known shortly.

POSITIVELY  
COLD, WIND &  
WET PROOF.

As sketch, with  
Fur Collar,

£10 10s.

## Robinson & Cleaver

The Linen Hall,  
Regent Street, London, W.

# ACETYLENE EQUIPMENT

The Pioneers of  
the Oxy-Acetylene  
Industry.

Formerly the  
Acetylene Illuminating  
Co., Ltd.

## COY., LTD.

MANUFACTURERS AND SUPPLIERS OF  
OXY-ACETYLENE EQUIPMENT & ACCESSORIES OF ALL KINDS

### High Pressure System:

Dissolved Acetylene, Cylinders  
and Gas Blowpipes, &c.



### Low Pressure System:

Acetylene Generators, Purifiers, Safety  
Valves, Blowpipes, &c. (Trade Mark  
"Endazzle.")

Address:

268 & 270, SOUTH LAMBETH ROAD,  
LONDON, S.W.8.

Branches in all Industrial Centres.

Telephone—Brixton 2171 (3 lines). Telegrams—Endazzle, London.

## ROK ROOFING

on a "Belfast Roof" is an  
ideal covering for Hangars.  
Any width

**UP TO 100 FEET  
CLEAR SPAN.**

Outlasts galvanized iron,  
more equable temperature.

## BRITISH & BEST

Write for Booklet "R."

49

D. ANDERSON & SON, Ltd., Lagan Felt Works,  
Belfast; and Roach Road Works, Old Ford, London, E.



# AEROPLANE PARTS.

Over 50 years' experience in the Manufacture of Tubular Parts for Cycles, Motor Cycles, and Side-Car Chassis

We are Experts in Tubular Constructional Work, Steel and Copper Tube Bending, and Pressed Steel Parts.

Send us your Enquiries.

**THE BURBURY CYCLE AND  
MOTOR WORKS,**

**389-397, FARM STREET. BIRMINGHAM.**

# B·G·L

METAL COMPONENTS  
FOR  
AIRCRAFT



Present output 25,000 parts per week—ranging from Elevators, Rudders, Exhausts, Tanks, Engine Bearers to Sockets, Wiring Plates and Small Pressings.

OUTPUT CAPACITY  
RAPIDLY INCREASING.

THE BIRMINGHAM GUILD LTD  
AERONAUTICAL ENGINEERS AND METAL WORKERS,  
GT. CHARLES STREET, BIRMINGHAM.

## A.G.S. WASHERS

Wire  
Work.

## THIMBLES

Turn Buttons.  
Eyelets.  
Washers.

## UNION NUTS & NIPPLES.

**W. H. BRISCOE & Co., Ltd.,**

**51, 52, 53, PARK STREET,  
BIRMINGHAM.**

Tel.: 550 Central  
Tel. Ad.: BRISK, BHAM.

Telephones:  
Gosport 217.  
Southampton 1861.  
London: Gerrard 5716

Telegrams:  
"Flight, Gosport."  
"Flying, Southampton."

## GOSPORT AIRCRAFT CO.

HEAD OFFICE: GOSPORT.

WORKS: GOSPORT & SOUTHAMPTON.

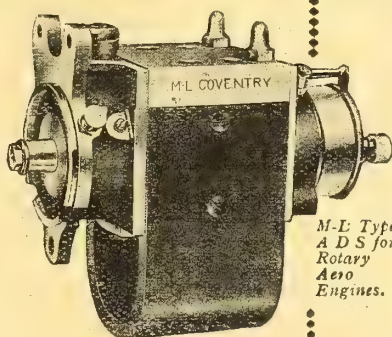
Sir Charles Allom.  
Charles E. Nicholson.

London Office: 15, George Street  
Hanover Square, W.1.



# ALL-BRITISH M-L MAGNETOS

M-L Magneto  
are smaller,  
lighter (yet  
stronger) than  
any pre-war  
magneto of  
like electrical  
capacity ...



M-L Type  
A D S for  
Rotary  
Aero  
Engines.

THE M-L MAGNETO SYNDICATE, LTD.,  
Victoria Works :: :: Coventry.  
Members of the British Ignition Apparatus Association.

Continued

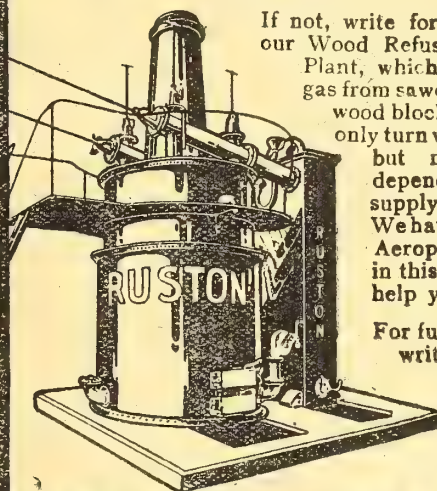
## What do you do with your Waste Wood?

Turn  
it into  
Power & Profit?

If not, write for particulars of  
our Wood Refuse Suction Gas  
Plant, which will generate  
gas from sawdust, chippings,  
wood blocks, etc., and not  
only turn waste into profit  
but make you in-  
dependent of coal  
supply.

We have helped other  
Aeroplane factories  
in this way. May we  
help you?

For fuller particulars  
write, on business  
note paper,  
mentioning  
AEROPLANE,  
to Sels  
Maters:



RUSTON PROCTOR & CO. LTD. LINCOLN

## AEROPLANE



## ACCESSORIES

7 Years' Experience.

## UNDERCARRIAGES

WE can deliver promptly  
all types of UNDER-  
CARRIAGES (Bristol, Avro,  
etc., etc.). Can we help  
you? Please send us your  
enquiries.

THE  
**RIVERS ENGINEERING**  
CO., LTD.

(CONTRACTORS TO THE AIR BOARD),  
27, LOTS ROAD, CHELSEA, LONDON, S.W.10.

Telephone: KENSINGTON 3116.

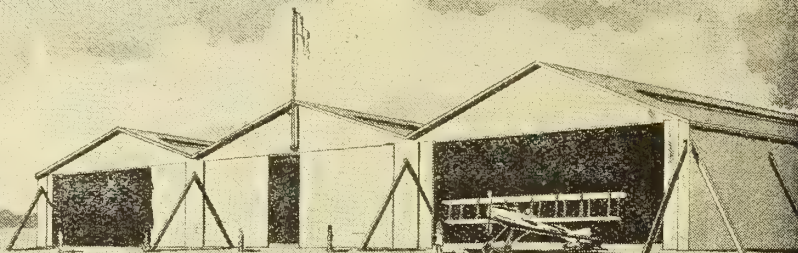


# T.W. PALMER & CO.

MERTON ABBEY IRONWORKS  
LONDON · SW · 19

ESTIMATES  
FREE

DESIGNERS · MANUFACTURERS AND  
ERECTORS OF EVERY DESCRIPTION OF  
AIRCRAFT BUILDINGS  
TEMPORARY OR PERMANENT



WORK · CARRIED · OUT · TO · OUR · OWN · OR · CUSTOMERS · DESIGNS

## THE SIBERIAN & GENERAL TRADING CO., LTD.

Can supply from stock or for prompt shipment

### PLYWOOD

IN ALL WOODS, SIZES AND THICKNESSES.

**SPECIALITY: BOARDS FOR AIRCRAFT WORK.**

HEAD OFFICE: 33, BISHOPSGATE, LONDON, E.C.2.

Telegrams—Wolosey, Led, London.

Telephone—London Wall 3577.

The **LARGEST** and most Up-to date  
**CIVILIAN SCHOOL**  
in ENGLAND.

**LEARN TO FLY at BOURNEMOUTH**  
IMMEDIATE VACANCIES.

12

Solo and Dual

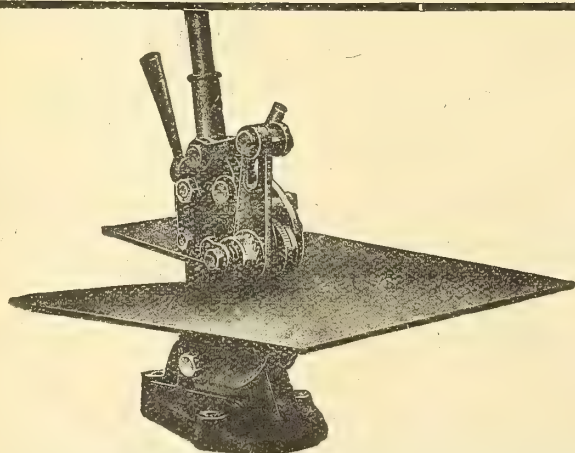
Aeroplanes in USE. Over 20

other Aeroplanes and Engines in stock.

School Approved by R. Ae. Club.

PUPILS COACHED FOR THE AIR SERVICES.

Particulars from **BOURNEMOUTH SCHOOL OF FLYING, BOURNEMOUTH.**



## 'TANGENT'

HAND

**SHEET SHEARING MACHINE**  
PATENT.

**SELF-FEEDING, FAST CUTTING.**

STEEL, 3/16 SOFTER METAL, 1/4."

Write for Descriptive Pamphlet and Prices.

**MONTGOMERY, SMITH & Co., Ltd.,**

PATENTEES AND MANUFACTURERS,

TANGENT WORKS, KEYNSHAM, SOMERSET.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



Registered Trade Mark.



Non-Inflammable Transparent Celluloid.

**LONDON LABEL CO., Ltd.,**

*Contractors to H.M. Government.*

**HARLEY WORKS, BECKTON RD., LONDON, E.**

**WIND SHIELDS  
MAP COVERS  
OBSERVATION PANELS  
*Prompt deliveries of every type.*  
LUMINOUS PRINTING**

Labels for Instrument boards, &c., for night work.

Any special article made up to templates or drawings  
and delivered by return.

N.B.—Nonflamoid is very much lighter and easier to work than  
any kind of glass, also it will stand much harder usage.

## **AIRSHIPS, LTD.**

**Manufacturers of Airships and Kite-Balloons**

**Contractors to the Admiralty**

**London Office:**  
**47, VICTORIA ST., S.W.**

**Works:**  
**HIGH ST., MERTON, and HENDON**

## **THE AIRCRAFT CONSTRUCTION CO.**

EVERY DESCRIPTION OF METAL COMPONENTS.

**Immediate Delivery of SE SUMPS.**

**HARLEY AEROPLANE WORKS, Beckton Rd., E. 16**

Telegrams: "Aercracons," Canning, London.

'Phone: East 1300.

**"NOVELLON" DOPE  
AND AEROPLANE VARNISH.  
CELLULOSE ACETATE & CHEMICALS**

**BRITISH CELLULOSE & CHEMICAL MANF'G.  
COMPANY, LIMITED.**

Telegrams:

Cellutate, London.

**8, WATERLOO PLACE, S.W.1.**

'Phone: Regent 4045.

**Works: Spondon, Derby; and Maybury Gardens, High Road, Willesden Green, N.W.10.**

(Telephone: Willesden 2380.)



# TIMBER

SILVER SPRUCE  
ENGLISH ASH  
WALNUT & MAHOGANY



**JOSEPH OWEN & SONS**  
Limited

Borough Saw Mills,  
LONDON, S.E.1.

Telephone: Hop 3811. Telegrams: "Busherom Sedist."

# AIRCRAFT COMPONENTS

QUICK DELIVERY  
OF ALL  
DESCRIPTIONS OF  
AEROPLANE  
COMPONENTS.



METAL FITTINGS,  
ETC., ETC.

'PHONE: LONDON WALL 6725.

**National Aircraft Mfg. Co.**  
15, HACKNEY ROAD, LONDON, E.2

# BRIGHT BOLTS & NUTS



1/4 in. diam. & upwards

(Suitable for Every Description of Engineering Work)

QUALITY, ACCURACY AND FINISH GUARANTEED

THE  
"HELICOID" LOCK-NUT

(THE FINEST LOCK-NUT IN THE WORLD.)

This nut will remain secure, no matter how great the vibration may be—in fact vibration actually tightens the grip.

(made from 1/2 in.  
to 2 1/2 in.)



(sample nut & prices  
on application)

We also manufacture Wrought Iron Railing and Gates, etc.

**BAYLISS, JONES & BAYLISS,**  
LTD.  
WOLVERHAMPTON.

London Offices: 139/141, CANNON ST., E.C.4.

Contractors to H.M. Government.

# SWIFT AVIATION CO.

Dolphin Engine Plates in Stock,  
Complete Sets.

*Speciality Sopwith Spares.*

# KINGSTON

PHONE—  
762 KINGSTON

'GRAMS—  
"SWIFT, KINGSTON"



## CHANDELIER CHAIN

FOR ALL PURPOSES.



Dozens of Sizes. Buy from Actual Makers.

Also all kinds of  
PRESSINGS, STAMPINGS & PIERCINGS.

**SMITH AND DAVIS, LIMITED.**  
BRASSFOUNDERS, BIRMINGHAM.

## Y.E.S. PHOSPHOR BRONZES

(Cast by 'EATONIA' Process.)

## Y.E.S. 'AERO' BRONZE

(Under A.I.D. Inspection.)

PERFECTLY ROUND SMOOTH BARS,  
for Automatic Machines, up to 3' 6" long.

THE MOST DURABLE YET PRODUCED.

SOLE PRODUCERS AND SELLERS:  
**YORKSHIRE ENGINEERING SUPPLIES, LTD.,**  
WORTLEY, LEEDS.

# Auster

(1914) LTD

for **AUSTER-TRIPLEX SHIELDS**  
**AERONAUTICAL ACCESSORIES**

LONDON: 133, Long Acre, W.C.

Telephone: Regent 5910.  
Telegrams: "Winflector, London."

BIRMINGHAM:

Crown Works, Barford Street.

Telephone: Midland 2123.  
Telegrams: "Auster, Birmingham."



## PRESS-WORK & SPINNINGS

and Sheet Metal (War) Work generally.

The LONDON ALUMINIUM Co., Ltd., Aircraft Dept.,  
Westwood Road, Aston, B'ham. Phone: East 497.

## 'FEARLESS' ENGINE CLEANING BRUSHES

As used by  
the R.F.C.



Send Trade Card  
for  
**FREE SAMPLE.**

**FEARLESS BRUSH CO., LTD.,** 4, NORTHWOLD RD.  
LONDON — N.16.

# Lang Propeller

LTD.

Contractors to  
the Admiralty  
and War Office.  
**WEYBRIDGE,**  
SURREY.

## HIDE GLUES

FOR AIRSCREWS AND  
AIRCRAFT CONSTRUCTION.

— APPROVED —

Manufacturers—Wm. OLDROYD & SONS, Ltd., 9, Mincing Lane, London, E.C.3.

Telephone: 4978 Avenue

THE

# "BOWSER" AEROPLANE SEATS

(Made to A.G.S. Drawing 264).

Supplied to the Royal Aircraft Factory and the Leading Aircraft Manufacturers.

Manufactured by **EDWARD BOWSER, 50, Park Lane, Leeds.** Tel. No.: Central 3473.

Under the A.I.D. Inspection.

Northern Representative—  
Mr. WALTER M. DANIELL,  
33, East Beach, Lytham.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



## THE POOLE AVIATION CO.

POOLE, DORSET.

*Contractors to H.M. Government.*

**Spares and all Parts of Machines.**

**ENQUIRIES INVITED.**

'Phone: Poole 54.

'Grams: Aviation, Poole

WE HAVE INVENTED

# THE DOPE POT

NON-EVAPORATING

ARTHUR HILL & Co.,  
SHEET METAL WORKS,  
SILCHESTER ROAD,  
LONDON, W.10.

Phone—1443 PARK.

**STAMPINGS  
WASHERS  
REPETITION WORK**

*in all Metals*

**BRIGHT DRAWN STEEL**

FOR

**AIRCRAFT and MOTOR WORK**

**J. B. GUTHRIE & SON**

(JOHN J. GUTHRIE)

**30, ST. MARY AXE, LONDON**

TELEGRAMS—BUSIRIS LED, LONDON. E.C.3.  
ELEPHONE—AVENUE 1432.

**HEATING, DRYING  
AND VENTILATION.**

**Kinnell's**

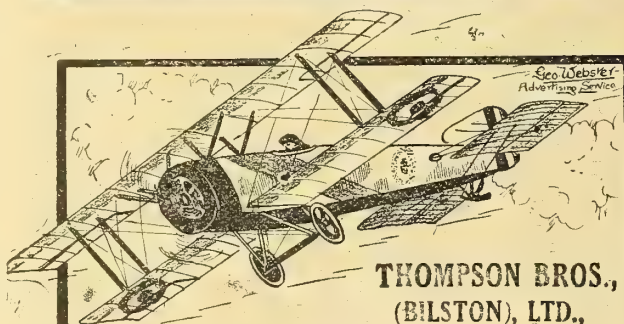
OF DOPE SHOPS, AERODROMES AND  
AIRCRAFT FACTORIES, &c. OF EVERY  
DESCRIPTION. List 1134 free.

**C. P. KINNELL & CO., LTD.** Phone—  
Hop 372  
65, SOUTHWARK ST., LONDON, S.E.1.

## HEATING AND VENTILATION

DOPE SHOPS, AERODROMES,  
AND AIRCRAFT FACTORIES.

**WHEELER & SONS,** Phone—  
PARK 652.  
1a, VICTORIA GARDENS, LONDON, W.11.



**THOMPSON BROS.,  
(BILSTON), LTD.,**

— FOR —

**UNDERCARRIAGES  
TUBULAR FRAMEWORK  
AERO. DEPT. BILSTON, Staffs.**

## Aeroplane Steel Sheets

as supplied by us to

**The Royal Aircraft Factory  
and leading Aeroplane Makers**

Guaranteed to comply with the R.A.F. No. 9A  
specification. Stocked in all gauges. (Sheets  
are passed and stamped by the "A.I.D.")

**BERNARD NICKLIN & CO.**

IRON AND STEEL WAREHOUSE  
SMETHWICK, BIRMINGHAM

Telegraphic Address:  
"Bernico," Birmingham.

Telephone No. 1  
224 Smethwick.

## WOOLER ENGINEERING CO. LTD

Specialise in MACHINED METAL FITTINGS,  
and can quote for PROMPT DELIVERY your  
requirements in EYE BOLTS, SOCKETS,  
ELEVATOR and FLAP LEVERS, HINGES, &c.

Do you want your Stampings and Castings  
Accurately Machined? Send us your enquiries.

Large Stock of All Sizes R.A.F. No. 3 A Spec.  
Limited Stock R.A.F. No. 1 E Spec.

Offices and Works:

**OLD OAK COMMON LANE,  
WILLESDEN JUNCTION, N.W. 10.**

Phone: Willesden 117

Telegrams: Two Stroke, London.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



**Berling Magneto**  
insures a hot, fat  
spark at any  
altitude

Worth more  
Does more



Manufactured  
by the  
**Ericsson Mfg. Co.**  
Buffalo N.Y. U.S.A.

**Aluminium  
Castings**

Sand or Die  
of every  
Description  
2 H.P. to 600 H.P.  
BEST METAL  
GOOD CASTINGS  
QUICK DELIVERIES



Contract L to  
H.M. Government  
**Chill Castings for  
Aeroplanes a Specialty**

Telephone: 3846 City. Telegrams: 4879 Central. Isling, London

**R W COAN**  
The Aluminium Foundry  
219, GOSWELL ROAD,  
LONDON, E.C.



*The Air Navigation Co., Ltd.*

**BLERIOT & SPAD  
AIRCRAFT WORKS,**  
ADDLESTONE (SURREY).

*Contractors to War Office and  
Admiralty.*

**Flying Ground — Brooklands Aerodrome.**

**NORBERT CHEREAU, Managing Director.**

Telegrams—Blériot, Weybridge. Telephone—353 Weybridge.

**"CROID"**  
LIQUID GLUE

Adopted by  
H.M. Admiralty, etc.  
Sole Manufacturers:  
**The Improved Liquid  
Glues Co., Ltd.,**  
Gt. Hermitage Street  
London, E.  
Contractors to H.M.  
Government.

*The Best*  
**Piston  
Rings**

Scientifically designed. Made from  
high tensile cast iron and hammered  
to give an even radial distribution  
of pressure. Castight. Sizes up to  
30 in. diam.

**The BRITISH CHUCK  
& PISTON RING CO. LTD.**  
Holbrook Lane, COVENTRY.

'Phone: CAMBS. 5. THE Wires CARBON," CAMBS.

**Cambridge School of Flying**

**30b, St. Andrew's St., Cambridge,**

beg to announce to **Manufacturers,**  
Engineers, Inventors, etc., that in addition to their

**FLYING COURSE** (Prospectus on  
Application) and  
**CORRESPONDENCE COURSE**

(Thorough and Up-to-date tuition) they re prepared  
to undertake **Tracing, Preparation of Working Drawings,**  
**Detail Design, Patent Specification Drgs., etc.**

**QUICK DELIVERY—CAREFUL WORK—MODERATE CHARGES**  
Enquiries to "Design Dept."

**CLABOUR-WESTBAY**

FOR

**2.B.A. Bolts—A.G.S. 103**

Entire Output at present absorbed  
—by Government Requirements.—

**W. A. Clabour, Westbay & Co.,**  
KIRKSTALL, LEEDS, Ltd.

Phone: Headingley 709. Telegrams: Clabour, Kirkstall.

**ZOTA**

**CASHMORE BROS. ENGINEERS**  
ZOTA WORKS, HILDBRETH ST., BALHAM, S.W.12  
BOLTS, NUTS, SCREWS, etc. for **AIRCRAFT**  
REPETITION WORK FOR ELECTRICAL, MEDICAL,  
AND OPTICAL INSTRUMENTS, AND FOR THE  
MOTOR TRADE

**WORKS**



## TRADE CARDS.

## AEROPLANE TIMBER SPECIALISTS

**JOSEPH OWEN & SONS, Ltd.,**  
**Borough Saw Mills, LONDON, S.E.**

Telephone: HOF 8811    Telegrams: "BUCHERON, SEDIST."

## Advertising

For GOOD ADVERTISING consult  
 Godbolds, 8, Breams Buildings,  
 London, E.C.4. Estimates Free.  
 'Phone: City 5912. E. H. Godbold,  
 Director



## JAMES NORTH HARDY &amp; SON, LTD.,

54, PORTLAND STREET, MANCHESTER,  
 MANUFACTURERS of all descriptions of COTTON and LINEN  
**WEBS, TAPES & TWINES FOR AIRCRAFT**  
**AND ELECTRICAL WORK.**

London Branch: 3, FITCHETT'S COURT, NOBLE STREET, E.C.4.  
 Mills: HEATON PARK, nr. MANCHESTER.  
 Tel. Add.: "Hardson," Manchester. 'Phone: No. 6471 Central.

## FREDK. WARD

— FOR —

## Aero Engine and Gun Gear Parts

ALSO PATTERN AND JIGS.

**ALLSOP ST., UPPER BAKER ST., N.W.**

Phone: Paddington 4743.

## NAME PLATES.

WE SPECIALISE IN EVERY DESCRIPTION OF  
 NAME PLATES IN METAL, VORINE, ETC.

**CLEGG METAL ENGRAVING CO.,**  
 CHATSWORTH WORKS, WORTHING.

## ALWIN ENGINEERING CO., AERONAUTICAL ENGINEERS.

A. E. CARTLIDGE.

LUTHER ROAD, TE DDINGTON, S.W.

Tel. No. Kingston 2412.



Makers of all kinds of Aircraft Fittings.  
 Presswork a Speciality.

Pressings for DeH, etc.  
 Avro, Sopwith, Fairey and many other types.

On receipt of Post Card our Representative will call and  
 give immediate quotation.

## Springs! Springs! Springs!

We make a speciality of  
 Springs for Aeroplanes.  
 SEND FOR PRICES.

**Dart Spring Co., West Bromwich.**

METRIC BOLTS & NUTS (5 m/m to 8 m/m).  
 Stock Lists on Application.

## CASHMORE BROS.,

TELEPHONE:  
 415 BATTERSEA

Zeta  
 Works

HILDRETH ST.,  
 BALHAM, S.W.

Screw-Cutting and Light Engineering. Accessories for Aircraft.  
 Electrical and Motor Trades. Brass and Iron Founders.

## TIMMS ENGINEERING WORKS

Makers of Jigs, Fixtures, and Special  
 Tools; also Aero Engine Compo-  
 nents and Gearing in quantities.

8a William St., West Kensington, W.14

## P.D.V. Aircraft Company, Ltd.

All Metal Parts for Aircraft made, comprising the  
 following machine work: **Milling, Turning,**  
**Shaping, Press Work, Slotting, Drilling, Grinding and**  
**Sheet Metal Work.** Well-equipped Welding and Brazing Plant.

Enquiries to - **P.D.V. AIRCRAFT COMPANY, Ltd.,**

Offices & Works: **Princes Street, Richmond, Surrey.**  
 Telegrams: Asres, Richmond. Telephone: 1661 Richmond.

## Chauvière's famous Integral Propellers

HOLD ALL RECORDS; USED BY ALL  
 LEADING AVIATORS. THE BEST

Sole Proprietors for Great Britain and Colonies

**THE INTEGRAL PROPELLER CO., LTD.,**  
 Edgware Road, The Hyde, Hendon, N.W. 9.

Telephone—Kingsbury 104. Telegrams—"Aviprop, Hyde, London."

## EBORA PROPELLER COMPANY LTD

*Ebora*

## PROPELLERS

Contractors to the ADMIRALTY & WAR OFFICE  
 11 & 12 SURBITON PARK TERRACE, KINGSTON-ON-THAMES

Telephone: KINGSTON 572

Telegrams: "EBORA, KINGSTON"

# SCREW-DRIVING

RUSSELL BROTHERS, Ltd., REDDITCH

# MACHINES.

Trade **MENDINE** Mark.

## LIQUID SCOTCH GLUE

USED BY THE LEADING AEROPLANE CONSTRUCTORS.  
 MOISTURE PROOF.

Write for Price List and Particulars

**MENDINE CO., 8, Arthur Street, London Bridge, E.C.**

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



Are YOU interested in Flying? If so, why are YOU not taking

## The Nottingham Flying and Correspondence Schools, Ltd., Course?

The Imperial Flying Service Pilots say it is the Best in the Country.

Write for Particulars and Illustrated Book issued Free.

**CASTLE MEADOW ROAD, NOTTINGHAM.**

'Phone 5766.

### MISCELLANEOUS ADVERTISEMENTS.

#### AVIATION

##### AVIATION INSTRUCTION

on up-to-date lines, by a qualified Engineer in Aeronautics. Demonstrations from complete set of parts, and sectioned models.

Send for Prospectus No. I.A.,

**THE MOTOR TRAINING INSTITUTE LTD.,**

10, Heddon Street, Regent Street, W. 1

##### AIRCRAFT PARTS.

**Hardwood for Aeroplanes.**—Specially Selected air-dried timber as supplied to leading constructors in Britain and the Continent. Silver Spruce, Ash, Poplar; Hickory and Ash Skids; Three-ply; Thin Cedar and Mahogany for Floats; Walnut for Propellers.—William Mallinson and Sons, Ltd., Hackney Road. 'Phone, 3845 Central, 4770 Wall.

**Tapes, Webs, Cords and Threads** in all qualities, suitable for Aircraft Work. Delivery from stock.—John MacLennan and Co., 30, Newgate Street, London, E.C.1. (See Advertisement Page IV. of cover and Buyers' Guide).

**Aeroplane Seats** to any drawing or specification. Prompt deliveries.—F. C. Chappell, Cane Works, 9, Fisher Street, Nottingham.

**Aeroplane Seats.** We can give quick delivery of cane seats, A.G.S. 264 or other patterns, guaranteed pass inspection. Write us for anything required in cane work.—The Willowbrook Company, Leicester.

**Bolts and Eye Bolts.**—We can make quick delivery of bolts and eye bolts of every size, and send quotation on demand.—R. L. Dubois and Co., Aeronautical Engineers and Manufacturers, 673, Romford Road, Manor Park, E.12.

**Plating and Polishing.**—We undertake any kind of nickel, copper, tin or brass plating. Mat or bright finish. Copper or steel tube Bending and Brazing.—Mona Plating Works, Barretts Grove, Stoke Newington, N.16.

**Announcement.**—Our factory at Holloway is equipped with an up-to-date plant, and we are prepared to undertake all classes of wood and metal work. Customers' orders quickly carried out to any design.—John Innes and Co., Aeronautical Engineers, 20, Denman Street, London, W.1. "Write us your needs."

#### FOR SALE

**Propeller Mahogany,** Honduras. 8 ft. and up by 8 ins. and up. Three cars in Liverpool. What offers?—Box No. 3450, THE AEROPLANE, 166, Piccadilly, London, W.1.

**Freehold Joinery Works** near Birmingham; substantially built, covered floor space, 11,000 square ft. Entrance from two streets. Site contains an additional 12,000. Price, £1,000.—Box No. 3440, THE AEROPLANE, 166, Piccadilly, London, W.1.

**Tarpaulins.**—Waterproof khaki sheets for sale; also few second-hand railway truck tarpaulins; London works.—For prices and particulars write Johnston, 12, Broughton Road, Croydon.

#### WANTED.

**Wanted Woodwork** for aeroplanes, very large up-to-date factory, fully equipped with latest machines; any class of aircraft work undertaken; prompt deliveries; best work.—Apply Box 3030, THE AEROPLANE, 166, Piccadilly, W.1

**Sheetmetal and Coppersmiths' work wanted.**—Midland firm is open to receive inquiries for tanks, sockets, fairings, and pipework, etc. Best work and prompt deliveries guaranteed.—Box No. 3415, THE AEROPLANE, 166, Piccadilly, W.1.

**Wanted,** by small Works in North London, work from end of March; 40 machines; various, bar work up to 2 in.; accuracy and steady output guaranteed. Preparation could commence immediately.—Box No. 3410, THE AEROPLANE, 166, Piccadilly, W.1.

**Wanted,** Sheet Metal Work and Oxy-Acetylene welding combined, high-class workmanship and prompt delivery.—Manwood, Miller and Co., Dukinfield.

**Wanted,** firm having machines available, also Die heads with High Speed Dies, could undertake fairly large quantities of threading work in  $\frac{1}{4}$ -inch,  $\frac{9}{32}$ -inch and  $\frac{5}{16}$ -inch B.S.F. Right and left-hand threads.—Box No. 3438, THE AEROPLANE, 166, Piccadilly, W.1.

**Required immediately,** Gnome engines and spare parts of same. Must be in first-class condition. Spot cash paid.—Ruffy, Arnell, and Baumann Aviation Co., Ltd., Noel Road, Acton, W.3.

**Wanted Aeroplane Propeller Cuttings,** mahogany and walnut. Any amount for cash.—Box No. 3423, THE AEROPLANE, 166, Piccadilly, W.1.

**Wanted** to purchase, as a going concern, small or medium-sized engineering works, equipped with small machine tools, suitable for the manufacture of automobile parts. Repetition machines particularly required. Situation should be preferably near London, but other localities considered. Replies treated in strict confidence.—Box No. 3453, THE AEROPLANE, 166, Piccadilly, W.1.

#### TO LET.

**Detached House** between Cricklewood and Hendon, new bijou residence; garden; allotment. Rent, £65 premium. Unfurnished, £60; might be let furnished. Immediate possession. Close trams. Hill position.—Tenant, Box 3455, THE AEROPLANE, 166, Piccadilly, London, W.1.

#### ENGINEERING.

**British School of Aeronautics.**—Aircraft Engineering Course; Aero Design; Aero Construction; Aero Draughtsmanship; Mechanical Engineering.—Pennington's, 254, Oxford Road, Manchester.

#### MISCELLANEOUS.

##### MAKE MONEY BY WRITING.

**£50 PRIZE.** Send postage (2d.) for particulars and copy of "How to Earn Money while Learning How to write for Newspapers and Magazines." Practical and Comprehensive Correspondence Courses—Fiction and Articles, etc. Expert Literary Directors. Constructive Criticism. Beginners taught how to make work saleable. Exceptional testimonials. Address "Editorial" (Dept. E.M.), 22, Chancery Lane, London, W.C.2.

**Glossary** of aeronautical words and phrases with diagrams and illustrations, English-French terms, metric equivalents. Invaluable to those interested in aircraft. Price, 1s. net, from Aircraft, 69, Bishopsgate, E.C.2.

#### MODELS.

**Model Aeroplane,** flies  $\frac{1}{4}$  mile circular flight, carriage paid, 3s. 4d. "I can thoroughly recommend your machines." Testimonial from Dr. Adams, Union Road, Sheffield. Thousands satisfied, testimonials from all parts.—Dept. C., Bristol Model Aeroplane Depot, Eastville, Bristol.

**T. W. K. Clarke and Co., Ltd.,** Model Department, Hampton Wick.—Though we are full up with full-size aeroplane parts orders, we still build models as we did in 1906. Sopwith Biplanes, etc., in Stock.—Send 3 stamps for our illustrated List, 120 items and 14 models; certain metal goods are out of stock.

**FULL UP NOW  
WITH WAR WORK**

but inviting your enquiries

for  
**After War  
Requirements**

**RANSOME & MARLES BEARING CO. LTD.**  
NEWARK-ON-TRENT London: 63 Queen Victoria St. E.C.4.



Established 1904



## MISCELLANEOUS ADVERTISEMENTS.

**SPECIAL PREPAID RATE:** 18 words 1/6; Situations Wanted ONLY, 18 words 1/-; 1d. per word after. **TRADE ADVERTISEMENTS.** in these columns, 3 lines 3/-; 10d. per line after. Public Announcements, Legal Notices, Auctions, Contracts, etc., 16 per line. For the convenience of Advertisers, replies can be received at the offices of "THE AEROPLANE" 166, Piccadilly, London, W.1.

## PATENTS.

**PAGE & ROWLINSON**, Chartered Patent Agents (Consulting Engineer, Mr. S. E. Page, A.M.Inst.C.E.), 27, Chancery Lane, London, W.C. Tel. 332 Central.  
**Henry Skerrett**, Chartered Patent Agent, 24, Temple Row, Birmingham.—Patents, trade marks, and designs.

## SITUATIONS VACANT.

**Draughtsmen**—Jig and Tool—wanted for high-class aero engine repetition work. Must have good machine shop and some drawing experience. Good salary and overtime pay for keen, practical, and intelligent men. No juniors need apply. Persons already employed on Government work will not be engaged.—Apply to nearest Employment Exchange, mentioning this paper and No. A4882.

**Draughtsmen and Assistant Draughtsmen** required on aeroplane work; good mechanical experience essential. No one on Government work need apply.—Applications must be made through your nearest Employment Exchange, mentioning this paper and No. 3457.

**Quantities Clerk** required in aeroplane works; able to read blue prints, take out quantities, and be responsible for ordering all metal work from schedules. East London district. No one living over ten miles away or already engaged on Government work need apply.—Write, Box 53, at Horncastle's 60, Cheapside, E.C.2.

**Three** neat, accurate aeroplane detail draughtsmen required immediately for urgent new work. Experience in stress calculations desirable, but not essential. No one on Government work need apply.—Full particulars of experience and salary required to Box No. 3456, THE AEROPLANE, 166, Piccadilly, London, W.1.

**Mechanical Draughtsman** required for machine shop. Good salary. London district. No one on Government work or residing more than 10 miles away need apply.—Box No. 3454, THE AEROPLANE, 166, Piccadilly, London, W.1.

**Required** at once 12 erectors used to planes, tail components, and fuselages of De H. 9 machines. Also 12 men, used to fitting engines to same machines. No one already engaged on Government work or living more than 10 miles away need apply.—The Ruffy, Arnell, and Baumann Aviation Co., Ltd., Noel Road, Acton, W.3.

**Several Good Engineering Draughtsmen** required by large controlled firm in Tyne district, manufacturing aircraft. Experience of aeronautical work desirable, but not essential. Good remuneration offered to competent men. No one on Government work need apply.—Write, stating age, experience, and qualifications, to your nearest Employment Exchange, mentioning this paper and No. 3443.

**Wanted** immediately a Chief Draughtsman for drawing office of a firm manufacturing aeroplanes (engines excluded) to Government designs under A.B. control. Only those experienced with aircraft need apply. No person on Government work will be engaged.—Apply, in first instance, to your nearest Employment Exchange, mentioning this paper and No. 3444.

**Viewers**, experienced in aircraft fittings, required for large aircraft factory, Southern district. No one on Government work need apply.—Applications, with full particulars of experience and previous employment, should be addressed to your nearest Employment Exchange, mentioning this paper and No. 3397.  
**Draughtsmen** and a "stress calculator" or two required in aviation works near London. Aeronautical experience and technical knowledge an advantage.—Write, stating particulars and salary required, to the Fairey Aviation Co., Ltd., Hayes, Middlesex.

**A Large Firm**, London, N.W., has several vacancies for aeroplane erectors and assemblers, used to accurate and high-class aeroplane work. No one living more than 10 miles away or engaged on Government work need write to Box 3360, THE AEROPLANE, 166, Piccadilly, W.1.

**Progress and Stock Control.** Capable organiser to take charge of department in large aircraft works. No one on Government work need apply.—State experience, general qualifications, salary, etc., to your nearest Employment Exchange, mentioning this paper and No. 3420.

**Smart Man** wanted for buying department, preferably one with aeroplane or motor experience; good opportunity for capable man. No one on Government work need apply.—State age, salary, and experience to nearest Employment Exchange, mentioning this paper and No. 3402.

## RADIATOR AND SHEET METAL WORK UNION WORKMEN (BEST RATES PAID) WANTED

No one already on Government work  
or resident more than ten miles away,  
will be engaged.

Apply—

**GALLAY RADIATOR CO., LTD.**  
198, Gt. Portland Street, W.3

## Situations Vacant.

**WANTED FOR WORK OF URGENT  
NATIONAL IMPORTANCE.**

OWING to the considerable increase in our business we have several vacancies for the following highly-skilled engineers:—

**WELDERS** (Oxy-Acetylene, Thermit & Electric).

**RADIATORS AND LAMP REPAIRERS.**

**STEEL MOULDERS. FITTERS. TURNERS**

We give highest London rates, plus liberal war bonuses Overtime. Excellent prospects for first-class men. Men not already engaged on Government work, or resident not more than 10 miles distant should apply at once to

**BARIMAR Ltd., 13, Lamb's Conduit  
Street, W.C.**

**Aeroplane Draughtsmen.**—Wanted by old established aeroplane manufacturers several first-class draughtsmen, with previous experience of aeronautical work preferred.—Apply, with full particulars of qualifications and salary required, to your nearest Employment Exchange, mentioning this paper and No. A4697. Men on Government work need not apply.

## SITUATIONS WANTED.

**Engineer**, with London office, wishes to represent a good firm manufacturing articles in connection with the aircraft industries.—Box 3386, THE AEROPLANE, 166, Piccadilly, W.1.

**Buyer**, aeronautical experience in large factory; previously in motor trade, desires similar position. Organising ability, tactful, keen on production.—Box No. 3428, THE AEROPLANE, 166, Piccadilly, W.1.

**Works Manager** requires similar position. A good practical man and excellent organiser. Can control labour.—Box 3447, THE AEROPLANE, 166, Piccadilly, London, W.1.

**Advertiser**, 31 (discharged), desires responsible post as Buyer; three years application to special materials and parts for engines and planes. Can undertake tools and general supplies equally well. Fifteen years' experience feeding large factories. Exceptional knowledge of quick and good sources of supply. Good education, appearance and address. Energetic, capable and reliable. £350.—Box No. 3434, THE AEROPLANE, 166, Piccadilly, W.1.

**Advertiser** (25), Grade III., public school and two years' university engineering education, desires **APPOINTMENT** under Government Department or on Government work. Some recent experience in Government inspection work.—Box No. 3391, THE AEROPLANE, 166, Piccadilly, W.1.

**Works Manager**, or position of trust, 37, practical engineer, invaluable experience both aeroplanes and seaplanes. Tactful, energetic, methodical organiser, accustomed to latest service methods and capable of economically increasing production.—Box 3284, THE AEROPLANE, 166, Piccadilly, W.1.

**Position** as Manager or Assistant Manager with engineering firm building aircraft, wanted by advertiser with three and a-half years' experience in construction, twelve months' flying experience, and over two and a-half years with present firm as assistant manager. Thoroughly well up in the construction of machines, tactful handling of men, and speeding up of output, etc. Any head of an aircraft works requiring a live assistant and practical man, thoroughly well up in every branch of the manufacture of aircraft, and who would be real assistance, with the best of references, and who is prepared to pay a fair salary should write making an appointment, to Box No. 3445, THE AEROPLANE, 166, Piccadilly, W.1.

**Experienced Foreman** wants position in aircraft works; all aero and seaplane fittings, coverings, tanks, complete machines. Has had charge of large aviation department employing over 400 hands, male and female labour; good organiser, strict disciplinarian; used to premium bonus and piece work; total abstainer; age 37.—8, Mall Road, Hammer-smith, W.6.

**Erector Foreman.**—Advertiser (silver badge) seeks situation. Aircraft experience of most types of land machines. Assembling and erecting of complete aeroplanes. Good education; excellent references.—Box 3442, THE AEROPLANE, 166, Piccadilly, London, W.1.

**Petrol Motors.**—Foreman Fitter desires position with firm on Government work. Fourteen years' absolutely first-class experience in the manufacture of petrol motors and motor cars. Strict disciplinarian. Good timekeeper. Conscientious worker, and well versed in modern methods of production. Can produce excellent references. Disengaged in one week.—Box 3452, THE AEROPLANE, 166, Piccadilly, London, W.1.

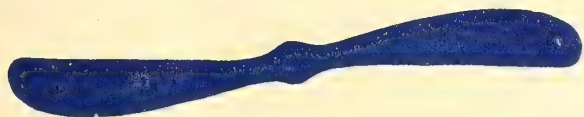
**Wanted** situation as fitter, assembling and overhauling for aero engine test department.—Box A.W. 3451, THE AEROPLANE, 166, Piccadilly, London, W.1.

**Foreman, Superintendent, or Assistant Manager.** Smart man, 24 years' experience, last 10 machine shop. Foreman, aeroplane and engine parts; tactful with labour; good organising ability; capable of getting maximum production. Excellent references from last and previous berths.—Box 3448, THE AEROPLANE, 166, Piccadilly, London, W.1.

**Foreman Sheet Metal Worker**, late foreman over sheet metal workers; used to all classes of aero and motor work, and handling large numbers of men.—Write, Box No. 3456, THE AEROPLANE, 166, Piccadilly, London, W.1.



# CHAUVIÈRE'S Integral Propellers



are used more extensively than  
any other Propeller in  
the World.

Hold all Records and are  
indisputably the best.

Maximum Efficiency.  
Best Workmanship.

**THE INTEGRAL PROPELLER CO., LTD.**

Edgware Road, The Hyde, Hendon, N.W.9.

Telegrams: "Aviprop, Hyde, London." Telephone Kingsbury 104.

# OXY-ACETYLENE WELDING & CUTTING

## PLANT

BLOW PIPES AND ALL WELDING ACCESSORIES  
CARBIDE. FLARELIGHTS. HANDLAMPS



PETROL AND OIL STORAGE TANKS OF ANY CAPACITY.  
STEEL BARRELS, SHEET METAL WORK FOR AIRCRAFT, &C.

**THE**  
**Acetylene Corporation Ltd.**  
**49 VICTORIA ST., WESTMINSTER.**

Telegrams:  
"Flamma, Vic, London."

Telephone:  
Victoria 4830.

ACCURACY



# J.H.ROBERTSON & CO

## AERONAUTICAL ENGINEERS

Tel. REGENT  
3996

LONDON OFFICE: 1, ALBEMARLE STREET. W. 1

*All classes of machining.*

FINE LIMIT WORK.

JIGS, GAUGES, AND SPECIAL TOOLS.

TURNBUCKLES, EYEBOLTS A.G.S. SPECIFICATION.  
STAMPINGS, AND HIGH-CLASS STEEL FORGINGS,  
PRESS WORK, &c.

OVERHAULING AND REPAIRS TO ALL TYPES OF  
AERO MOTORS.

PROPELLERS FOR ALL TYPES OF AIRCRAFT.

CRANKSHAFTS, PISTONS, GUDGEON PINS, VALVES A SPECIALITY.



# **THE GREEN ENGINE**

## **CO., LTD.**



**:: CONTRACTORS TO ::  
H.M. ADMIRALTY  
AND WAR OFFICE.**

# **166, PICCADILLY, W.1.**

Telegrams: "Aircengine, London"

Telephones: Gerrara 8165; Richmond 1293.

Telephone:- City 3115.
ESTABLISHED 1875
Telegrams:-  
Vandura Cent. London.

## **TAPES, WEBS,**

## **CORDS & THREADS**

*for Aircraft*  
*Electrical & Munition Work.*  
*Delivery from Stock.*



### **JOHN MACLENNAN & CO**

**30 NEWGATE ST LONDON E.C.1.**  
**AND AT GLASGOW.**

*Contractors to H.M. Government.*

EDITORIAL AND ADVERTISEMENT OFFICES, 166, PICCADILLY, W.1.

Printed for THE AEROPLANE AND GENERAL PUBLISHING CO., LTD., by BONNER & CO., The Chancery Lane Press, Rolls Passage, London; and Published by THE ROLLS HOUSE PUBLISHING COMPANY, LTD., at Rolls House, Breems Buildings, London.



# THE AEROPLANE

WEDNESDAY, MARCH 27, 1918.

Saturday  
Extra

Vol. XIV, No. 13

THREEPENCE WEEKLY

[Registered at the G.P.O.  
as a Newspaper.]

## THE NORMAN THOMPSON FLIGHT CO. Ltd.

ESTABLISHED 1909

Telegram—SOARING, BOGNOR  
ENTIFLYTE CHARLES, LONDON

Works—MIDDLETON, BOGNOR

CONTRACTORS TO THE ADMIRALTY

Telephone—BOGNOR 48. GERRARD 7385

London Office—

DEWAR HOUSE, 11, HAYMARKET, S.W.1.

DESIGNERS AND MANUFACTURERS OF FLYING BOATS AND LAND PLANES

**Auster** FOR **Aero-shields**  
LONDON. BIRMINGHAM

**BEARDMORE** AERO  
ENGINES

**TITANINE**  
NON-POISONOUS  
**DOPE**  
SEE ADVERT. INSIDE.

TELEPHONE:  
OLDBURY 111.

**ACCLES & POLLOCK, LIMITED.**

TELEGRAMS:—  
ACCLES OLDBURY

WELDLESS STEEL TUBES FOR AIRCRAFT CONSTRUCTION.

SEE ADVERT. INSIDE.

**TRIPLEX** Safety **GLASS**

See Advt. inside



# THE ENGINEERING TIMBER CO. Ltd.

11, Victoria Street, London, S.W.

J. E. HUSON, Managing Director.

Telephone: Victoria—5073, 4210

Telegrams: Entikosil, Vic. London.

**SILVER SPRUCE**

**ASH**

**WEST VIRGINIAN SPRUCE**

**WALNUT**

**MAHOGANY**

**GLASGOW:**

**67, HOPE STREET.**

Telephone: Central 3273.

Telegraphic Address: Entikosil, Glasgow.

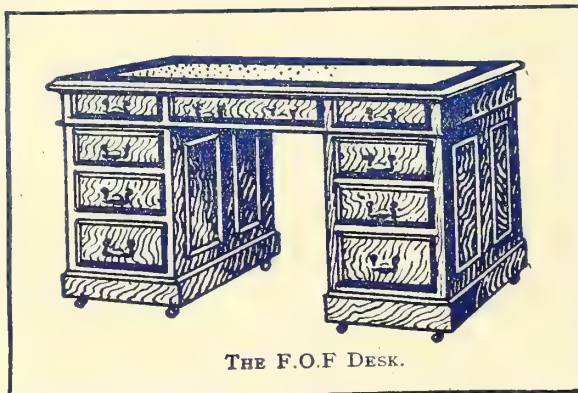
**PARIS AGENCY:**

**6, RUE DE HAVRE, PARIS.**

## Factory and Office Furniture

LARGEST STOCK FOR IMMEDIATE DELIVERY (NEW AND SECOND-HAND).

SPECIALITY



SAFES.

## COOKE'S (FINSBURY) LTD.

FINSBURY PAVEMENT HOUSE,  
LONDON :: :: E.C. 2.

Telephones: LONDON 6179  
WALL 573

See Telephone Book relating to our  
Shopfitting, Signs and other Departments



# EMAILLITE

NON-POISONOUS

AEROPLANE DOPE.

THE ORIGINAL AND STILL THE PREMIER.

AS  
TIGHT



AS  
A DRUM.

*Trade Mark.*

THE BRITISH EMAILLITE CO., LTD.,

Contractors to the Air Board.

Registered Offices:

30, Regent Street, Piccadilly, S.W.1.

Wire—"Ridleyren, Piccy, London."

"Phone—280 Gerrard

Works

5, Hythe Road, Cumberland Park,

Willesden Junction, N.W.10.

Telephone—Willesden 2346 & 2347.

Metal  
Fittings  
a  
Speciality.

**The Aero Mechanical Co., Ltd.**

CONTRACTORS TO THE AIR BOARD.

60-66, ROCHESTER ROW, LONDON, S.W.1.

Telephone :  
Vic. 7570 (3 lines).

Managing Directors :  
E. Salomon, J. Fogelson

Complete Fittings  
and Dies in Stock for  
latest D.H. Machines ;  
also most of the Fittings  
for other D.H. Machines  
and Handley-Page.

Our reputation has been built up by our ability to effect  
deliveries right up to time.



# GNÔME & LE RHONE ENGINE COMPANY

**Contractors to the  
War Office and Admiralty**

**London Offices :**

**27, BUCKINGHAM GATE, S.W.1., and THE HYDE, HENDON, N.W.9.**

**Works: Blackhorse Lane, Walthamstow.**





# CONTRACTORS TO H·M·AIR MINISTRY

Designers & Manufacturers of  
Aero Engines & Aeroplanes

*The*  
**SIDDELEY-DEASY**  
**MOTOR CAR CO Ltd**  
COVENTRY

*Luxurious Motor Carriages*  
*Aero Engines*  
*Aeroplanes*

Godbolds;





**NON-POISONOUS  
DOPE**

**TITANINE**



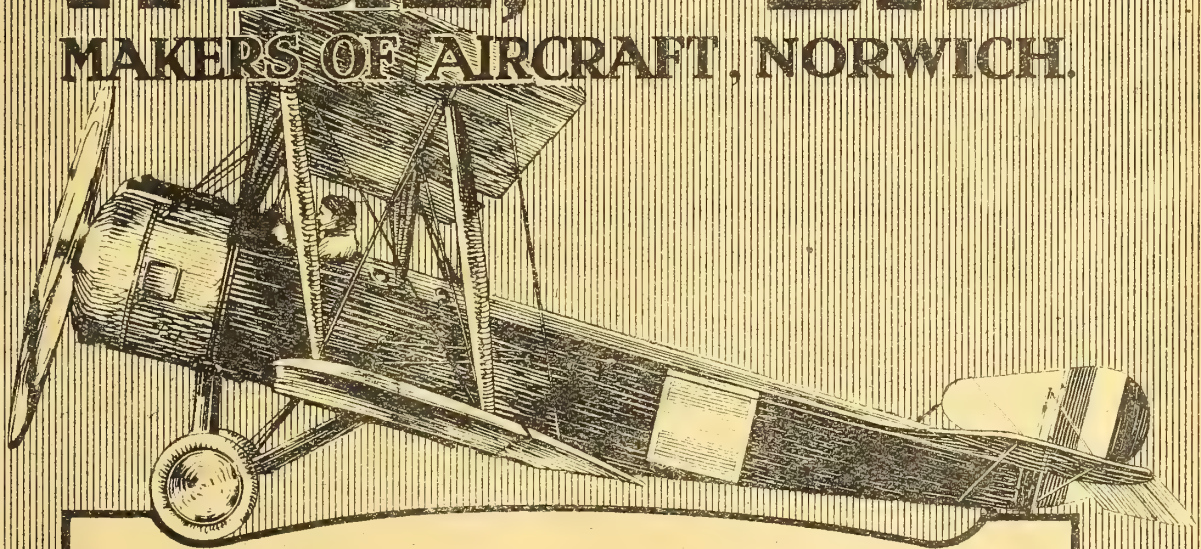
THE  
**BRITISH AEROPLANE  
VARNISH CO., LTD.**  
166, PICCADILLY, LONDON, W.1

Telephone . . . . . GERRARD 2312.  
Telegram . . . . . TETRAFREE, PICCY, LONDON.

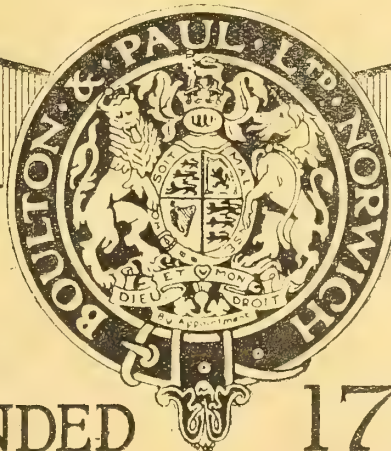


# BOULTON & PAUL, LTD

## MAKERS OF AIRCRAFT, NORWICH.



THE name of BOULTON & PAUL, Ltd., immediately suggests the highest possible standard of craftsmanship in metals and wood. So, when the need came, the firm was amongst the first chosen for this special work, and fully maintaining its reputation, is now amongst the largest contractors for Aircraft Construction.



Telegrams: "AVIATION, NORWICH."

Telephone: 851 NORWICH (5 lines)

FOUNDED 1797





# WHITEHEAD

## AIRCRAFT



GEORGE WATSON

**RICHMOND**  
SURREY







## **A. V. ROE & Co., Ltd.**

**Aeroplane  
Constructors.**

**NEWTON HEATH  
MANCHESTER.**

**Telephones—  
City 8530 and 8531.**

**Telegrams—Triplane.**



**HAMBLE,  
near SOUTHAMPTON.**

**Telephone—  
Hamble 18.**

**Telegrams—  
Roe, Hamble.**

**AEROPLANES**

**AND**

**PARTS.**

**166, PICCADILLY,  
LONDON, W.1.**

**Telephone—  
Gerrard 3186.**

**Telegrams—  
Senalpirt, Phone.**

**CODE: A.B.C.: 5th Edition.**





# The AEROPLANE

The Editorial and Advertising Offices of "The Aeroplane" are at 166, Piccadilly, London W.1.  
 Telegraphic Address: "Aileron, London." Telephone: Mayfair, 5407.  
 Accounts, and all correspondence relating thereto, should be sent to the Registered Offices of  
 The Aeroplane and General Publishing Co., Ltd., Rolls House, Breams Buildings, E.C.4.  
 Subscription Rates, post free: Home, 3 months, 8s. 10d.; 6 months, 7s. 7d.; 12 months, 15s. 2d.  
 Foreign, 3 months, 5s. 0d.; 6 months, 10s. 0d.; 12 months, 20s. 0d. Canada, 1 Year, \$4.70c.  
 U.S.A., 1 Year, \$5.20c.

## ON A POISSON D'AVRIL.

Unless some High Authority changes the date because he is so utterly devoid of humour as to be afraid that the R.A.F. will become known in history as the Royal April Firsts, the new Third Service will have come officially into being before the next issue of this paper appears. It was inevitable that the First of April should be the date of its birth, because the Treasury closes its financial year on March 31st, and consequently any epoch-making invention of this nature has to be born on the first of the following month, so that the people who mismanage the nation's finance may close their books decently and in order. Of course, it might be possible in this case to wash out April 1st, and declare it a *dies non*, as well as a Bank Holiday, and so leave the Air Force financially as well as professionally in the air for a whole day, but if that were done it would be even a greater joke against the Force than being known as the Royal April Firsts.

After all there are plenty of regiments in the Army with even finer traditions than those which the R.F.C. has yet had time to acquire which possess opprobrious nicknames. There are the Dirty Half Hundred, the Lilywhites, and the Featherbeds, to name only a few, and it is certain that none of those regiments would change its nickname for any of those epithalamic epithets which the servants of our Lords of Propaganda evolve.

As one ventured to remind the Force last week, Christians of the superior denominations wear the sign of the cross in memory of one of the world's greatest tragedies, and the cross was worn the more proudly by the early Christian martyrs because crucifixion was at that period the most disgraceful death imaginable. The early Christians had to be no ordinary people to be able to live up to their faith—of course hardly any of them ever lived up to the teaching of their founder, but that is another matter. They had to possess unwavering bravery, indifference to death in the various unpleasant forms which were considered humorous by their Roman masters, and very strong *esprit de corps*, in fact the very psychological qualities which would have made of them on Earth as excellent a Flying Service as they hoped to be in Heaven.

### THE PRIDE WHICH IS HUMILITY.

Precisely the same indifference to death and ridicule and the same strong *esprit de corps* is needed if the R.A.F. is to justify not merely its existence, but all the fuss and worry which its birth has caused. If some of the young officers who, having no hereditary Service traditions, regard the great arrival with calm indifference could only know how hot and bothered a number of immensely senior brass-hatted, *aes triplex* as fitted in fact, people have been about the result of the misalliance they would perhaps be misled into thinking that they are very much more important than they are.

It is very important that the Force should cultivate

a due sense of humility along with its *esprit de corps*. The pride which is humility is a very different thing from the pride which apes humility. The ruin of the Christian religion and of the Mohammedan religion, and probably of others, considered as religions and as distinct from political forces, was the growth of that pride which apes humility. When that pride arose factions rose with it, with the result that for some 1700 years out of the 1900 years during which Christianity has existed its votaries have spent most of their time, as Mr. Thackeray's Irishman said, "massacreeing one another for the love o' God." [Thank you, kind reader! If it was not Thackeray who was it?] It is earnestly to be hoped that the growth of sinful pride and of factional feeling will be avoided in the Force.

### THE UNFORTUNATE NAME.

By the way! What a singularly unfortunate choice the name Royal Air Force is in every way. One cannot abbreviate it to R.A.F. without thinking either of the Farnborough fiasco or the First of April (same thing perhaps), and one cannot reduce it to Force—as one reduces the present Flying Services to Service or Corps as the case may be—without thinking either of the flat-footed policeman from whom the ballad bids us ask the time, or else of Sunny Jim and patent breakfast food.

An attempt has been made to get away from the R.A.F. by arranging the initials on the pilots' wings thus "ARF." And the net result will be probably that the Force will be known as the "Not 'Arfs."

And it could all have been avoided so easily by doing the simple right thing, bringing in a short Bill to legalise the use of the word "Imperial," and calling it the Imperial Air Service.

### THE NAVY'S JONAH.

Anyhow, to return to the question of faction fights. There are all the elements already in existence, and the Air Council will have to be fairly successful if it is to avoid something very like mutiny in spots. The fact is that the majority of the seaplane people do not want to belong to the R.A.F. Curious as it may seem, considering how the R.N.A.S. has been treated by the Navy, most of the seaplane people want to belong to the Navy. And, "curiouser and curiouser"—as Alice said—the Navy as a whole is at last showing distinct signs of being willing to accept the seaplane aviator and his assorted accomplices as being men and brothers who are even more akin to the sailor-man than is the depressed and suppressed Marine.

Something of the feeling on this point is shown in the accompanying pathetic picture, which has arrived from a person unknown, depicting the newly arrived R.A.F. as a lightly camouflaged R.F.C. whale about to swallow the startled and horrified R.N.A.S. on April 1st. Presumably the slight separation of the sailor-man



from his little boat expresses the aerial nature of the R.N.A.S. as well as the fright of the sailor at his imminent absorption. [Thank you again, kind reader! One is quite aware that the whale has a very small throat and could not swallow even a decent-sized fish, let alone a man. Also that the whale is a mammal and not a fish. Also that it was a "great fish" which swallowed Jonah, and not a whale as is vulgarly supposed. But cartoonists and leader-writers as well as poets and composers of legends must be allowed a little poetic license.]

#### A POSSIBLE RELIEF.

The R.N.A.S. has for so long been regarded as a kind of Jonah by the Navy that one is inclined to wonder whether the Jonah parable may not apply in this case. Reference has been made in this paper from time to time to that excellent series of mnemonic verses concerning Hebrew history which one found so useful at school. There is one verse which applies excellently in this case. It runs:—

"Jonah was in the tummy of a whale  
Three days—and nights accordin'—  
Jonah gave a kick, and the whale was sick,  
And threwed him over Jordin."

Apart from the lamentable spelling of Jordan—due solely to the exigencies of rhyme—the verse has its merits, being concise, graphic, and historically as accurate as most history of that or any other period. It will be interesting to see whether the kicking of the seaplane people will have the same emetic effect on the R.A.F. as Jonah's had on his great fish. One forgets what result the jettisoning of Jonah had on his ship, and history does not record the ultimate fate of the great fish, but one is perfectly sure that the fish experienced much relief.

One is quite prepared to believe that Jonah was really the most active and brainy member of his ship's company, and was thrown overboard chiefly because they grew peevish with him on account of his insistence in telling them that they did not know how to run their job. This same insistence is one of the chief reasons why the R.N.A.S. is not loved by the Royal Navy. And the fact that the R.N.A.S. was right has not endeared them any more to their sea-going relatives, though

recent proofs of its rightness has probably caused an eleventh-hour repentance at the Admiralty for letting the R.N.A.S. be swallowed by the R.A.F.

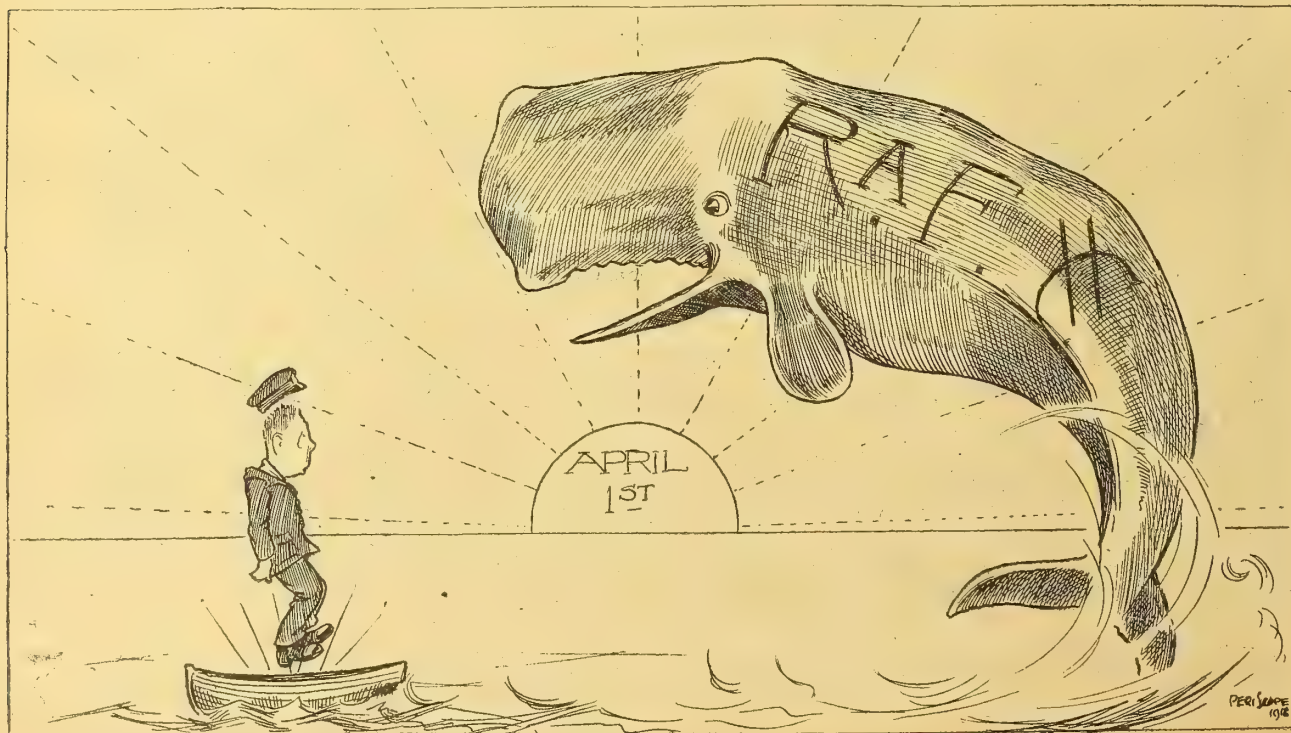
#### THE FUTURE OF NAVAL FLYING.

Only last week an Admiralty communiqué concerning successful seaplane fighting in the Heligoland Bight seems to indicate a renewal of real Naval aerial activity. Which gives one hopes that the Admiralty may yet see the error of its ways, and realise that if it does not gather its Jonah back to its bosom and insist on having a purely Naval Air Service whose officers and men are genuine R.N., it will end by the Royal Air Force having to keep a private Navy of its own, so that its operations may be properly conducted. And there is a horrid possibility that in future wars, if not in the last few years of this war, the R.A.F.'s Navy may be a bigger, as it will certainly be a more important, thing than the Royal Navy.

When Naval Aviation is properly developed, the day of the big surface-ship will be done. With properly handled torpedo-carrying seaplanes no ship can exist above water. The Royal Navy will have to make its choice in the next year or two between becoming almost altogether a Naval Air Service, or becoming entirely a Submarine Service. There will be no place for ordinary ships on top of the water. Let those brains at the Admiralty which still retain their activity think over that statement of fact.

#### A MATTER OF UNIFORM.

Meantime, if the R.A.F. insists on retaining the R.N.A.S. seaplanes for a period, the Air Council will do well to make some difference in uniform between the seaplane people and the shore-going folk. Possibly the seaplane people might be permitted to wear blue shoulder-straps and a blue cap-band, leaving the military aviators the bare khaki shoulder. Also the military side might well wear the regulation cap with the pancake top, leaving the seaplane people the naval cap with the omelette top. And the military side might also stick to the khaki cap-band, or the pale blue of the R.F.C. staff instead of the hideous black band which is now regulation—unless of course the Air Council



A Poisson d'Avril.



particularly wishes the Air Force to look as if it were in mourning for the sins of the R.A.F.

The R.A.F. uniform is not so beautiful a thing that it cannot be improved. One noticed, on the occasion of the R.F.C. Hospital Matinée, a gallant young officer who had bravely donned the whole khaki sealed-pattern R.A.F. rig. He was presumably an R.F.C. officer, for he wore the ribbons of the D.S.O. and the Military Cross with a bar. Possibly the bar was awarded for his gallantry in being the first to appear in public in the new costume. If so he deserved it. Whether he complied with King's Regulations in wearing the uniform of a Force which does not as yet legally exist is a matter on which one hesitates to express an opinion. His tunic was evidently made by a good tailor and not by a costumier, but the omelette cap, the lack of a Sam Browne, the funeral cap-band, and the curious gilt antennæ on each side of the cap-badge—reminding one of the horns of a golden cockchafer—spoilt what would otherwise have been a fine soldierly figure. On the whole there is distinct room for improvement in the design of the costume.

#### A PROPER PERSPECTIVE.

One or two earnest young friends have suggested that by poking fun at the Royal Air Force one is decreasing the pride of the newly joined people in their new profession of arms, and is thus likely to lessen that enthusiasm and *esprit de corps* which is vital to the new Third Arm. Far from such being the fact, one believes that a little healthy criticism of the anomalies introduced by the kind gentlemen who are responsible for the formation of the force will tend to help the newcomers to see things in their proper perspective.

It is well to teach these youngsters that they are joining a force which has to start from nothing and build up its own traditions. Being now entirely separated from the Army, it cannot trade on the reputation of the British soldier. It has to make a reputation for itself.

We have had a great deal too much limelight on our aviators. There has been too much of the "Heroes of the Air," "Glorious Deeds of British Birdmen," and so forth, to be thoroughly healthy for a force composed entirely of young men whose heads are easily turned by popularity and flattery. The young aviator should

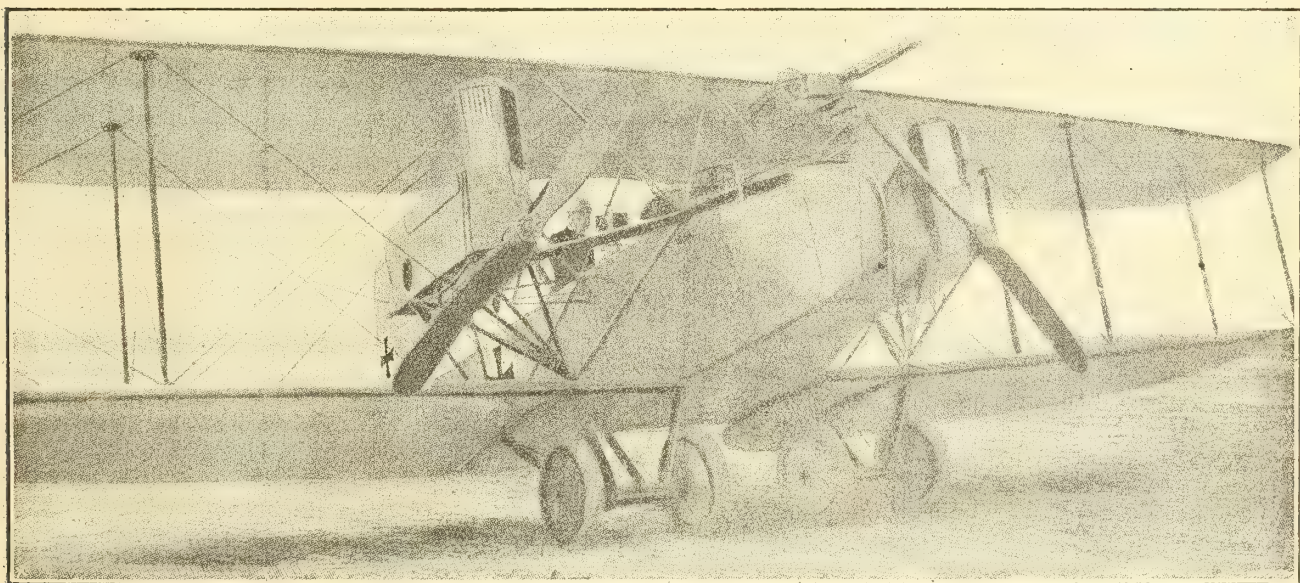
be taught that he is extremely lucky to have the chance of making war like a gentleman and not like a cross between a navy and a tramp. If one has to go and make war one can imagine no more delightful way of doing it than by going out to be killed for a few hours a day, and spending the rest of the time in comfortable huts replete with all the comforts of a home, from tablecloths to Kirchner pictures.

#### THE FORTUNATE FORCE.

From what one has seen personally of the R.F.C. in France they live—and deservedly so—very much better than do the bulk of the civilian population in this country. Even in the depth of winter, when wood is scarce and coal unobtainable, they are no worse off than is the London householder when the noblemen of the coal trade refuse to deliver coal because there is an inch of snow on the ground. By contrast with the infantryman, sleeping in a wet trench, feeding out of a tin with a jack-knife and his fingers, or "resting" in a ruined barn under constant shell-fire, the life of the active-service aviator is a prolonged picnic.

He has every opportunity and incentive to be a hero. It is so much more possible to be brave when one is well housed and well fed than it is when one is miserable, cold, and hungry. The really satisfactory thing is that the Flying Services so far have been composed of such excellent human material that they have taken the fullest advantage of their fortunate circumstances, and so have done their duty to their King to the utmost degree which anyone could expect of them.

What should be impressed on the newly joined R.A.F. aviator is that, so far from being a hero for joining the Force, he is very fortunate in having been permitted to join it: that he is a very humble member of the very newest of the King's Services: that if he does his duty as an officer and gentleman he may some day be worthy to take precedence with, but after, an officer of the corresponding rank in the Army: that on his endeavours it depends whether the R.A.F. builds up traditions worthy of the King's other Services: and that he should comport himself lowly and reverently before his betters until he has justified his right to be alive at all. In fact, he should cultivate the state of mind of the small boy who, kneeling beside his little bed, prays:—"Please God, make me a good boy, and make me a soldier when I'm good enough."—C. G. G.



The Siemens-Schuckert "Grossflugzeug," Twin-Engine Bombing Biplane, a comparatively recent German effort, and the predecessor of the Siemens-Schuckert "Riesenflugzeug," or Giant Aeroplane, which is rumoured to have four or six engines.



## THE HOBHOUSE-NORMAN-MARCONI-TELEFUNKEN AFFAIR.

It is only necessary at present to place briefly on record the outline of the course taken by the latest Marconi Scandal.

On Tuesday, March 19th, after the last issue of this paper had gone to press, Sir Charles Hobhouse, late Postmaster-General, made a long statement in the House of Commons, protesting his innocence of the charge made by Mr. Godfrey Isaac that he and Sir Henry Norman had been negotiating just before the war with the German Telefunken Co. to induce that firm to come over here and compete with the Marconi Co.

Sir H. Norman also made a personal statement, in the course of which, referring to the alleged letter from the Telefunken directors (reproduced in last week's *AEROPLANE*), he stated—and he much regretted that he was not afforded the opportunity of making the statement on oath—that he made no such offer or offer of any kind to the Telefunken Company or to anybody else, nor did his right hon. friend, so far as he knew. Such an idea never entered his mind. He had no position or authority to make any offer.

No charge of any kind would lie against him if he had entered into commercial relations with anybody on the subject of wireless telegraphy, but as a matter of fact he never entered into any such relations, although he had often been asked to do so. He had always endeavoured, by visiting every wireless station he could, by procuring apparatus of any new kind and testing it in his own workshop, to keep himself abreast of wireless progress, and whenever he had come across anything of interest to bring it to the attention of the British authorities.

He had no knowledge of any communication or interviews between his right hon. friend and Mr. Godfrey Isaac. The statement that he had made an offer in the sense of the alleged Telefunken Company's letter was not only untrue, but absurd. His whole contention in the matter of the Imperial wireless chain had been that no company, syndicate, or commercial organisation should be allowed to erect stations, but that the State itself should do so. He hoped the House would consider that he had made his action perfectly clear.

### MORE INFORMATION WANTED.

So far as it goes that is a perfectly fair and clear statement of fact, but it will be noted that Sir Henry Norman does not deny that he was in Berlin with Mr. Hobhouse, nor that he was in communication with the Telefunken directors. Nor does he indicate in any way what was his business with the Telefunken Company. His statement is very much more remarkable for what it conceals than for what it reveals.

Therefore it is the more important that if Sir Henry Norman is to remain a member of the Air Council—whether he becomes Air Minister or not—we should know considerably more about this business. It is above all things necessary that the officers and men of the Royal Air Force should have the same complete confidence in the integrity and honesty of purpose of their civilian political chiefs as they have in those distinguished officers of the Senior Services under whom they have the honour and pleasure to serve.

Any suspicion that a member of the Air Council had pro-German sympathies, or financial ties with Germany, would be fatal to the confidence of the Air Force in the Air Council, and Sir Henry Norman's concealment of facts does not give people confidence in his methods. Therefore it seems clear that either Sir Henry Norman must clear himself of Mr. Godfrey Isaac's charge, or

he must cease to be a member of a Council for which his qualifications, in any event, have not yet been disclosed.

### THE ISAAC-HOBHOUSE ARGUMENT.

Happily it seems possible that Sir Henry Norman will have an opportunity of clearing his reputation on oath, for on Wednesday, March 20th, Mr. Godfrey Isaac sent a letter to Sir Charles Hobhouse, expressing his surprise that Sir Charles did not go into the witness-box and clear himself, instead of writing to the Judge asking him to excuse his attendance. Mr. Isaac also challenged Sir Charles to take proceedings against him or repeat outside the House of Commons his charges against him (Mr. Isaac), and promising to take legal steps if he did so.

Sir Charles replied on the same day, denying that he had asked to be excused from giving evidence, and saying that he only wanted to avoid coming into court till his evidence was actually required.

On Thursday, March 21st, Mr. Isaac again challenged Sir C. Hobhouse "to come into the open so that your veracity and honour and mine may be put to the test in open Court," and wound up by saying "It is, as you say, for the public to draw their own inference, and I confidently invite them to do so."

On Saturday, March 23rd, Mr. Hobhouse published a letter denying Mr. Isaac's charges, and on Monday, March 25th, Mr. Isaac issued a writ against him.

One hopes to see this unsavoury business cleared up very soon, and not left to drag on for months as in the case of the previous Marconi Scandal, for in the meantime Sir Henry Norman's position remains unexplained.

### THE POLITICAL TANGLE.

The position is, in fact, rather peculiar and involved on the political side. Mr. George, who was proved in the pre-war Marconi Enquiry to be financially interested in Marconi Shares, and to have dabbled in them, on the advice of Mr. Godfrey Isaac, before the signing of the advantageous Marconi contract by the then Government of which he was a member, is now Prime Minister, and ostensibly the leader of the British Nation.

Sir Rufus Isaac, through whom Mr. George came in contact with the Marconi Company and became involved in his little flutter in shares, is now Lord Reading and holds the high office of Lord Chief Justice—presumably when he can spare time from being Minister Plenipotentiary to the United States.

Therefore one assumes that the Isaac family are friends of Mr. George.

Sir Henry Norman has been appointed a Member of the Air Council by the Prime Minister, and is therefore presumably also a friend of Mr. George.

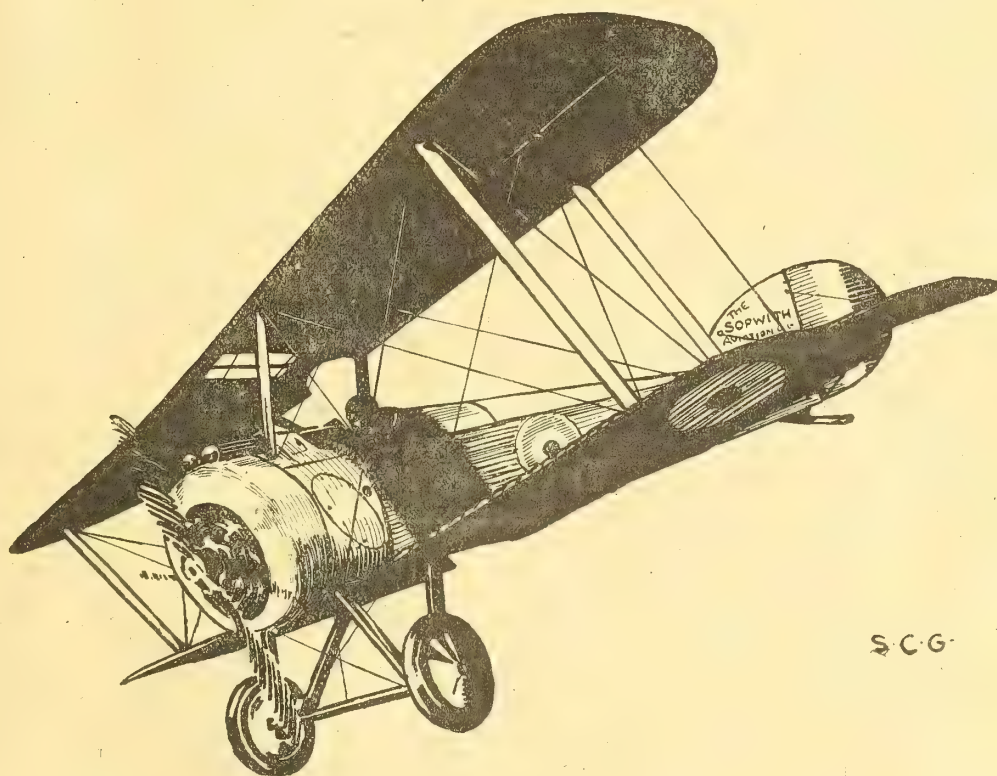
But, judging from the correspondence, Sir Henry Norman is not a friend of Mr. Isaac, nor of the Marconi Company in which Mr. George was at one time so deeply interested—both financially and as a Cabinet Minister.

On the other hand, Sir Henry Norman has not yet stated whether, before the war, he was friendly with the Telefunken Company, the enemies of the Marconi Company, and inferentially of Mr. George.

The position is really very confusing, and in the interests of purity in public life it is earnestly to be hoped that Sir Charles Hobhouse will accept Mr. Godfrey Isaac's challenge to a few rounds in the legal arena. It is high time, at this stage of affairs, that honest men came by their own.—C. G. G.



# THE SOPWITH



**AVIATION COMPANY, LIMITED**  
**KINGSTON-ON-THAMES, ENGLAND.**  

---

**CONTRACTORS TO H.M. GOVERNMENT.**

---

Telephone: KINGSTON 1988 (8 lines).  
Telegrams: SOPWITH, KINGSTON.



Paris Office :  
21, RUE DU MONT THABOR.



## THE GREAT BATTLE.

Without for a moment believing that the fighting over the old Somme battlefield is the decisive battle of the war, as so many writers have said, one may safely say that it is the greatest battle of the war. The systematic Russian defeats of the period of Tannenberg and the Masurian Lakes probably involved greater numbers of men, but their results were less important. The present fighting cannot be decisive, because none can believe, by any stretch of the imagination, that either France, Britain, or Germany can be so defeated in this battle as to be put out of the war immediately, or as to be permanently disabled from future recovery.

In the case of the Allies such defeat is even less possible than in the case of Germany, for, with America only just getting to work, the Allies' possibilities for recuperation after a set-back are greater than Germany's. One is inclined to believe that the effort is Germany's great attempt to force a decision before America's full weight is felt, and the failure of that attempt may make the battle decisive in that it may be the turning point of the war to the extent that Germany may never make another great attack. Nevertheless, even if America's millions were all in France to-day, and all fully trained, Germany could still fight a defensive war for years to come. And the longer the delay before Germany is placed on the defensive the better is Germany's chance of re-victualling herself by commandeering Russia's food supplies.

The one solitary consolation about the whole position is that at last the Western Allies are fighting their own fight, and are clear of the Russian incubus. At the outbreak of war this paper stated clearly that in fighting as the Allies of Russia we were on the wrong side. Many months before the war one quoted, apropos our entente with Russia, Mr. Kipling's allegorical verses with the refrain, "Make not your peace with Adam-Zad, the bear that walks like a man," and one warned the civilised peoples to have nothing to do with the Russians. The net result of that warning was a minatory visit to this office from a somewhat unpleasing Tartar officer.

There is an old American saying that "the only good Indian is a dead Indian." Nevertheless, there are good live Indians, as the Canadian and American Armies now know, having fought alongside them instead of against them. Similarly there may be good Russians, but the experience of having fought alongside Russia as a nation does not cause such a reversal of ideas as that which the Red Indian soldier has caused among his white comrades.

The German's estimate of the Russians, when he called them "manure-folk," seems to have been truer than our own. The so-called aristocracy whose women-folk could be taken in by a Rasputin, and whose military people could be bought and sold for cash, is better dead than alive. The world is better without them. And the world is still better without the human beasts whose revolutionary atrocities make those of the French Revolution 125 years ago seem like a P.S.A. meeting.

Seemingly the only decent inhabitants of the Russian Empire are the Cossack and Turcoman tribes, who, being pure savages, have a savage's virtues. They may yet serve a useful purpose in the world. But the Russian of Russia is only fit to be a serf and to be driven with the knout. It is not without reason that the Slav peoples have given to Europe in their race-names some of the most opprobrious epithets in the European languages.

Therefore, one hopes to see the Allies agree to let Japan loose in Siberia to work as far west as possible and counter the German move eastward. One is quite

aware of all the objections, which diplomacy forbids one to discuss in detail when referring to an Ally, but one may advance the following points without giving offence.

Someone has got to put Russia in order. That someone must obviously be either Germany or Japan. By giving Japan a free hand in Siberia, we should make a field of action which would absorb the energy of Japan's surplus population for many years to come, and probably for generations. Thus the constant anxiety of the American Pacific Coast, and of Australia and New Zealand, lest they should be over-run by Japanese cheap labour would be relieved.

And, if in years to come, when time brings its curious reversals of feelings and of interests, some criminally ambitious individual arose in Russia who insisted on invading Europe, it seems that it would be better Europe to fight a Russia organised by Japan, with Germanic peoples as buffer States fighting on the side of Europe, than for the Anglo-Saxon and Frankish and Latin peoples to fight a Russia organised by Germany with the Germanic States fighting on the side of the Slavs.

However, be that as it may, the Anglo-Saxon and Latin peoples are now fairly and squarely opposed to the Teuton peoples, and the Slav race is out of the fight, except for oddments such as those Bulgars and Servians who are the slaves and servants of the Teutons. We must now stand or fall by our own merits, as the Western Europeans did in the days of Attila and of Charles Martel and of Charlemagne.

So far as this country is concerned, we seem to be near our making or breaking. If only something would happen, anything, no matter what, to rid us of our politicians, we should be a made nation. If not, we must break and re-form, at a great cost to the nation. Even such breaking does not mean defeat, but rather prolonging the war.

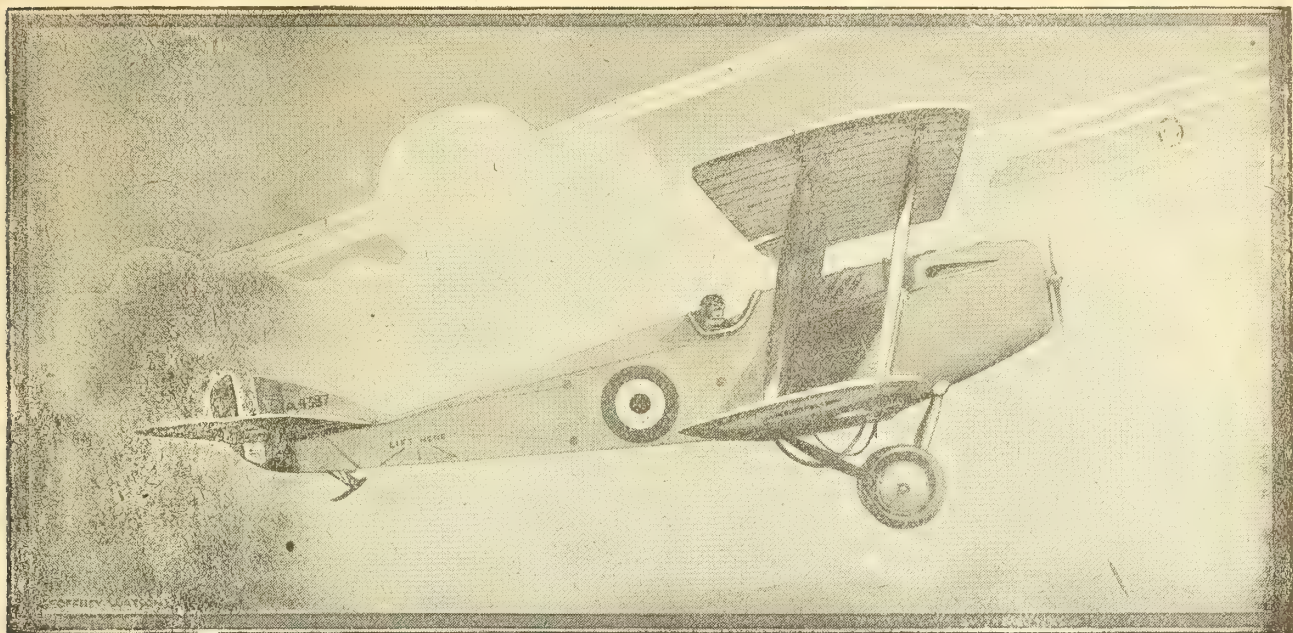
As concerns the great battle now in progress, the Hun has, as usual, had all the luck of the weather. Thick mists to hide his early-morning assemblies from our air-scouts, and to make observation difficult all day long. Dry ground on which to manoeuvre, where we have always had wet. Still air, so that his poison-gas was not blown away quickly. One is inclined to wonder whether Germany's strategists rely on their meteorologists as much as on all their other scientists. If so, their meteorological knowledge and organisation must be far in advance of ours, although we hold all the information area over the Atlantic, whence comes all change of weather.

In spite of these disabilities, the R.F.C. and those R.N.A.S. and Australian squadrons associated with it have done marvels. Their ascendancy over the enemy in the air is greater than ever. The fact that, despite that ascendancy, the course of the battle should have gone as it has done, shows that the time is not yet come when wars are won in the air. Yet, if the Allied Flying Services were sufficiently multiplied, as they will be in due course, the war on the ground might be very greatly influenced by the systematic invasion of Germany—as has so often been demonstrated in this paper.

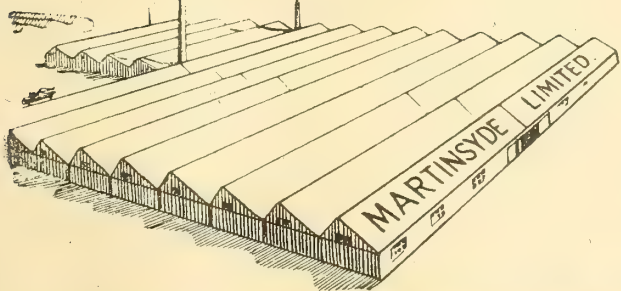
Political and politico-military intrigue has hindered the arrival of that day, but things are changing for the better. During the past week our Flying Services have fought the greatest fights in their brief but notable history. Next week they emerge as the Royal Air Force. Thus they expire in a blaze of glory worthy of their great future. R.N.A.S. and R.F.C. *Ave atque vale!*

C. G. G.





# MARTINSYDE



Aerodrome . and  
Auxiliary Works:  
BROOKLANDS.  
Head Office  
& Works :  
WOKING , Surrey.





### THAT GUN!

Presumably one ought to say something about that 75-mile gun which is said to be bombarding Paris with 9-inch shell. The number of people who know all about it is as great as the number of people who invented the Tanks.

One gentleman talks of a shell with a double-streamline shape something like a Howard-Wright plane-section. Another talks of a rifled shell fired from a smooth-bore gun, and swears that the original shell, made in London eight years ago, may be seen in Mr. Blanch's gun-shop somewhere at the back of Lime Street, E.C. One newspaper, appositely, talks of a shell with a film of hot air round it. Another digs up the Bachelet Levitated Railway—the principles of which have been known to every budding switch-board puncher for the last twenty years, though never before developed as a music-hall stunt—and tries to turn it into an electric gun.

The only sensible suggestion comes from a gunner officer, who, writing in the "Morning Post," says practically "Read your Jules Verne!" and recalls the gun built in a hill which fired the heroes of the story to the moon—and, one might recall also the gun built into the side of Mount Kilimanjaro, which was to have shifted the axis of the Earth, and would have done so but for the fact that the mathematical "expert" who was working out the figures accidentally rubbed three noughts off a blackboard and went on calculating without noticing the loss of them. This gunner says that there is nothing impossible about a built-up gun, without traverse or elevation, fixed in one place to bombard one huge target. It seems to be purely a matter of the length of the gun and the size of the charge used, and "fakes" do not enter into the scheme.

If there be a gun of such a sort it would seem that it cannot last long, though while it lasts it must be very annoying. And, of course, it can be replaced by another in a different position, ready to start when the first one wears out. If ever the Hun hosts captured Calais there would be, apparently, nothing much to prevent them from bombarding London, which is only a matter of 90 miles or so distant.

Those who do not believe in the gun suggest that a 9.5-inch shell is being fired from a Davis "double-end" gun carried on a Zeppelin at 23,000 feet, some 15 or 20 miles from Paris. Apart from the fact that the noise of such a gun would give it away at once, the blast from the two ends would rip an airship to pieces, although the gun has no recoil.

If one wants a possible explanation, one suggests that the "shelling stunt" could be worked perfectly well by using a few of the new high-flying Rumplers to drop shells, instead of bombs, at regular intervals, and so scare Paris into the belief that it was being shelled. The new Rumplers have a ceiling of some 20,000 feet with pilot, passenger, guns, and full war load. If carrying only a pilot, a 9.5 shell, and enough petrol for only 150 miles, one could afford to fit a fairly effective silencer, and in any case it is doubtful whether a single machine at something like 22,000 to 24,000 feet would be heard, even with an open exhaust. And they would certainly not be seen. It would be quite easy to put up such a bluff, and then advertise an imaginary gun, for the sake of the moral effect.

Meantime, quite possibly the gun really exists. If it does, there seems to be a chance for French aviators to do some real "cavalry of the air" work, such as Stewart's and Sheridan's cavalry did in the American Civil War, when they used to work round the rear of the enemy armies and pick up such unconsidered trifles as General Officers, supply trains, and so forth. To our aerial "cavalry," the cutting up of a gun crew and the destruction of their gun should be a mere bagatelle.

C. G. G.

### THE STANDARDISATION OF AIRCRAFT.

An Inter-Allied Conference on aircraft standardisation, more especially in regard to materials, arranged by the British Engineering Standards Committee, was recently held in London at the Institution of Civil Engineers. The delegates were welcomed officially by Mr. Churchill, Minister of Munitions.

Sir Maurice Fitzmaurice, vice-chairman of the committee, welcomed the delegates, and explained that the standardisation of the components of aircraft and aircraft engines was being carried out by the committee as a war measure for the Department of Aircraft Production of the Ministry of Munitions.

Mr. Churchill said that the thanks of all were due to the committee for having taken over this very important sphere of action, and for having relieved the Technical Department of the Ministry of Munitions of a heavy and important branch of what would otherwise have been their work. He thought that very little had in reality been lost, and in some respects much had been gained, by not entering on a general scheme of standardisation until sufficient experience had been accumulated to enable such standardisation to reach its maximum effect.

A too rigid standardisation in the early stages of development and unduly tended to hamper progress and design.

Alluding to the gloomy views taken by some people regarding

the war, he said that he felt that such people could have no real knowledge or appreciation of the importance and power of aircraft. German resources were incomparably less than those of the Allies, who had the whole world to draw on, and by developing these resources remorselessly it was certainly within the Allies' power to dictate a military decision to their opponents.

Mr. F. G. Diffin, chairman of the American Commission, stated that the United States were wholeheartedly in this war, as Allies and friends, with the sole desire of attaining the best possible results for the common good. He agreed that standardisation could be better effected to-day on the knowledge of what had passed than if it had been instituted earlier, and remarked that the only way to absolute success was through complete unity of action. The work was of tremendous importance, and he firmly believed that, if the fundamentals were kept well to the fore, most effective results could undoubtedly be achieved.

Colonel Dorand, chief of the French delegation, and Deputy Giuseppe Grassi, of the Italian delegation, expressed their Governments' desire most cordially to co-operate in the work of standardisation, which was fully recognised to be of the greatest value to production.

Sir William Weir, Director-General of Aircraft Production, said that he had come to the conclusion that the best results would be achieved by carrying out standardisation under the direct responsibility of the Engineering Standards Committee, as that body possessed a wealth of experience in the domain of standardisation generally. In particular, he had been influenced by the fact that the Committee, in all its work, had associated itself with the manufacturers and suppliers intimately concerned with the production of the material in question, and that it was able to obtain a realisation of the possibilities of what could actually be done during the war—which was the most important thing at the moment. He felt sure that the conference would be of the highest value to the aircraft programme of the Allies generally.

Sir Henry Fowler, K.B.E., Assistant Director-General of Aircraft Production, and chairman of the sectional committee of the Engineering Standards Committee immediately concerned in carrying out the work of aircraft standardisation in Great Britain, presided over the technical sessions, which were attended by the delegates and by a large number of officers of the departments of the Air Ministry interested in the details of the subjects discussed.

It has been decided to recommend that permanent authoritative committees be instituted in Great Britain, Canada, France, Italy, and the United States, in order to maintain continuity of action and to carry forward in the most efficient manner possible the work of co-ordination, the Engineering Standards Committee, for the time being, acting as the distributing centre of this permanent international organisation. It was suggested that the Committees should be constituted as follows:—

FRANCE.—M. le Colonel Dorand (Inspecteur-Général des Etudes et Expériences techniques), Captain Etevé, Captain Pierron, Lieutenant Boislevé.

ITALY.—M. le Commandant Benza, Chef des Services de la Provisionnement de l'Aviation Italienne, Député G. Grassi, and Lt. A. Bonomi.

UNITED STATES OF AMERICA.—Mr. F. G. Diffin, chairman of the Aircraft Standards Board of the American Aircraft Board, Dr. W. F. Durand, Lt.-Comdr. D. Briscoe, Mr. Coker F. Clarkson, Mr. E. H. Ehrman, Mr. Charles M. Manly, Mr. James Hartness, Dr. A. L. Colby, Mr. F. G. Ericson, Capt. A. Tilt, Dr. F. R. Baxter, Lt. L. Selden.

GREAT BRITAIN.—Sir Henry Fowler, K.B.E., Comdr. H. Anstey, Mr. A. E. Berriman, O.B.E., Mr. P. C. Cooper, Lt.-Col. M. O'Gorman, C.B., Dr. H. S. Hele-Shaw, Brig.-Gen. Sir Capel Holden, K.C.B., R.A., Comdr. C. F. Jenkin, M.B.E., R.N.V.R., Capt. G. W. C. Kaye, R.E., Mr. C. C. Paterson, O.B.E., Mr. A. A. Remington, Capt. A. A. Ross, Lt.-Comdr. E. S. Saunders, R.N.V.R., Capt. T. Worswick.

### THE RIGHT THING.

An excellent example of the right way in which to conduct necessary agitations was given by the employees of an aircraft firm recently. As is usual with our official methods, things had been going wrong in the district, food supplies had been badly handled and the workpeople of that area found it necessary to demonstrate against the local methods of distribution. Naturally the demonstration had to take place in daylight which meant, of course, all hands knocking off work during the period of the demonstration.

In the case of this particular factory all hands voluntarily put in overtime during the following week to make up the time which they had lost in attending the demonstration, and suggested voluntarily that this overtime should be charged at their ordinary rates of pay. This was a thoroughly reasonable and patriotic method of operation and is one which is strongly to be recommended wherever demonstrations are found to be necessary in future.



# WESTLAND *Aircraft.*

WESTLAND AIRCRAFT WORKS.  
BRANCH OF PETTERS LIMTD.  
YEOVIL.

*Phone, Yeovil 141. Telegram Aircraft Yeovil.*





# THE AIR COUNCIL AND ITS FUNCTIONS.

(Continued.)

BY HENRY FORESTER.

## THE DIRECTOR-GENERAL OF AIRCRAFT PRODUCTION.

The next member of the Air Council whose sphere of activity is to be described is the Director-General of Aircraft Production. This official, though nothing is laid down in the Royal Warrant, possibly exists for the duration of the war only.

In pre-war days the supply of matériel and similar necessities of the Forces was divided between the Master-General of the Ordnance and the Quartermaster-General, each of whom put out orders for such things as he required to the limit of the financial aid allotted him by the Treasury. In an autocracy there is little reason to believe that this system would not have continued, as an expansion of the office of each would have made the additional work a matter of simplicity, with the additional advantage of having centralised control. But in democracies it is necessary to provide spectacular reasons for the increase in expenditure.

Had, for instance, the Army Council ordered shells on a colossal scale—as they desired to do—little praise and consistent criticism would have harassed their efforts. The populace would have thought it all unnecessary, or at least misplaced. Swayed only by facile speech or the careful advertisement of the “strong silent man” (who has raised a newspaper or a grocery store to a pinnacle of notoriety), the simple methods, unheralded by a public canvass, of the soldier or sailor do not attract them. The system must be wrong since the placards and the newsprints have so little to say of the inner workings.

## THE GENESIS OF “THE MINISTRY.”

Hence it is necessary that some politician whose gilded words and elastic conscience have enthralled the masses should undertake the work that could better be done by those whose business it is. The public, because they are told it is so, believe these men to be their saviours, and in consequence give a warm support to an expenditure and to measures which in calmer times would undergo a careful scrutiny. In such manner the Ministry of Munitions came into being.

The Ministry has one valuable duty—that of co-ordination in manufacture. When a nation is put to the supreme test as is the case with Great Britain in these present days, there is a limit to the output of military matériel. It is no longer possible to order and to receive all that may be wanted of each instrument of war. It is no longer sufficient in order to make this possible to cut down unessential manufactures.

We have in fact reached a time when every hundred additional aeroplanes means a consequent decrease in the output of shells or of motor-cars or any other of the countless articles which are now classified as munitions of war. Hence it is necessary that there shall be some central body responsible to the War Cabinet for the settlement of the priority of all orders by Government departments—to decide one day whether typewriters in the making may reduce the output of gas masks, or whether siege guns are more urgent than torpedo nets.

## THE SUCCESS OF “THE MINISTRY.”

This duty has been undertaken by the Ministry of Munitions with considerable success, and there is little doubt that friction between the great Departments of State has been avoided as a result. But with co-ordination its sphere of activity should end. There is no good reason why the Ministry of Munitions should initiate in any way save in the acceleration of production. Design should be entirely unaffected by its

officials who might reasonably devote their time to inspection and to improvements in the method of manufacture.

## THE DUTIES OF THE PRODUCTION DEPARTMENT.

But to return to the subject of this article. The Director-General of Equipment, while he exists to perform the duties which would properly fall to the Controller-General of Equipment, is himself in a dual position in that while he sits as a member of the Air Council he at the same time is an official of the Ministry of Munitions, whose deliberations he enlightens with airy point and argument.

At the Air Ministry he is charged with the production of aircraft in all their variety—at the Ministry of Munitions he assists in the co-ordination of this category of manufacture with that of other kinds of matériel. Thus in one capacity or the other he comes into the closest possible contact with the aeronautical trade, and is the connecting link between that newest of industries and the Service it has the honour to supply.

If this official must exist, it is well that he should have a seat on the Air Council, as he is consequently enabled to communicate direct with the departmental chiefs of the Air Force on terms of working intimacy.

## CONFLICTING CLAIMS.

He must arrange the conflicting claims of standardisation and of improvement. If rapidity of instruction is desired, then it is absolutely necessary to standardise to a large degree. Nevertheless, care has to be taken to prevent the Service from suffering because a huge order for aeroplanes of one type must be exhausted or scrapped before newer models are supplied in any quantity.

It is unfair to the pilots to expect them to fly aeroplanes whose design is fast becoming enshrined in the records of antiquity, but it is equally unfair to the public if the money of the State is expended on the completion of contracts for machines which must necessarily be destroyed as worthless or left idle in obscure stores. The problem would seem insoluble, but it is for the settlement of such difficulties as these that the Director-General of Aircraft Equipment exists.

He and his advisers are responsible in consultation with other members of the Air Council for the decision as to the probable duration of type. He can ascertain from the Chief of the Air Staff what likelihood there is of making use of aircraft not suited for warfare on the Western Front in other parts of the earth where desultory wars still drag on towards a weary conclusion.

## STANDARDISING DETAIL.

In place of standardising types he can arrange for the standardisation of fittings, so that there need no longer be, say, three hundred types of bolts made to serve one purpose on varied machines, nor a multiplicity of landing wheels where one type might equally serve. In the early days of motoring, pneumatic tyres were made in hundreds of sizes, to the confusion of the public and the immediate but not ultimate profit of the makers. To-day there are scarcely a dozen sizes in common use.

In my last article it was implied that the experimental establishments of the Air Force were to be under the Master-General of Equipment. This would appear to be a wrong deduction from the Army parallel, as Major Baird in his speech of February 21st stated that the Technical Department and all that is therein implied is to be under the Director-General of Aircraft Production.

(To be continued.)



THE BRITISH & COLONIAL  
AEROPLANE CO., LIMITED

— FILTO , BRISTOL —

CONSTRUCTORS OF

*The "Bristol" Aeroplanes.*

— CONTRACTORS TO —  
H.M. AIR FORCES.

Telegrams :  
"AVIATION, BRISTOL."



Telephones :  
3906 BRISTOL  
(Private Branch Exchange)



## AIR BOARD APPOINTMENTS.

The Secretary of State for the Royal Air Force has appointed Captain J. L. L. Wrench, C.M.G., to be Private Secretary and Captain G. Philippi, M.C., to be Assistant Private Secretary.

## AIRCRAFT IN THE LORDS.

On March 21st Lord Balfour, in calling attention to the abandonment of the scheme for an aviation base at Loch Doon, asked on whose authority the scheme was undertaken and on whose authority it was abandoned. His information was that some three millions of money had been spent on the scheme. He moved for a return of the expenditure involved.

Lord Rothermere, President of the Air Council, said he was not aware who was really responsible for the scheme. The Air Board was not in possession of the information. But if it was desired he would endeavour to obtain full particulars and communicate the information. The responsibility for its abandonment rested with the Air Council. The Air Council took over the construction of the work, and it was then found that Loch Doon was not suited for an aviation base. The project proved far more costly than was anticipated. The authorised expenditure was £120,000, and £420,000 was spent and sanctioned. It was very doubtful whether, after the expenditure of further considerable sums, the site would ever be suitable. An unfavourable report was received, and under these circumstances he invited two members of the Air Council to proceed to Loch Doon and report, and upon that report the Air Council decided that they had no alternative but to abandon the scheme, and the Army Council was so informed. The Air Council's decision was based on the fact that after 18 months' work Loch Doon was unfit for the scheme. The engineering difficulties were greater than anticipated. Sir John Hunter came to the conclusion that it could not be made available for aviation purposes. It would be, in his view, criminal to neglect anything that would conduce to increased efficiency. But the fact was that Loch Doon proved no good. The site was chosen in a hurry, and, that being so, he ventured to think that it was impossible to justify any further expenditure on the scheme.

Lord Haldane thought this an unfortunate and regrettable incident. Those responsible for the scheme ought to have been able to discover that Loch Doon was a wholly unsuitable place for the Air Service. He trusted no such thing would happen in the future.

Lord Rothermere, replying to a question, said they were still looking for another site. Lord Beresford: Who was responsible for this scheme? Lord Rothermere: I cannot say, nor do I know who was responsible. Lord Balfour: In what Ministry was it actually authorised? Lord Rothermere: I believe it was authorised in June, 1916. Earl Camperdown thought the House ought to know the names of those responsible for the scheme, and the whole facts should be published to the country. There was no shadow of doubt that £400,000 of public money had been wasted, and the people who made this muddle should be made amenable to public opinion. He ventured to hope that the noble lord would furnish them with a return of the persons who were responsible for this scheme.

Earl Curzon, Lord President of the Council, urged the House not to pass any motion on this subject at all. The noble lord had said that a great mistake had been made, and that had been accepted by the House. He thought the noble lord was right when he said that this was a War Office scheme. At any rate it was only decided upon after a careful examination by experts or so-called experts. Nobody would have embarked on anything of this sort without some information of a detailed character. He agreed that their lordships were entitled to further information on the subject, and if Lord Balfour put down another question on the paper the information would be supplied.

The motion was by leave withdrawn.

[There is at least as good evidence in favour of saying that the scheme was quite sound if it had been carried out by capable engineers, and had not been hampered by red tape and departmental jealousies. It is also said, that, if properly handled, the existing works could still be finished and the whole place made a going concern at little extra expense and within reasonable time.—Ed.]

## AIRCRAFT IN THE COMMONS.

On March 7th the Chancellor of the Exchequer (Mr. Bonar Law), in moving the Vote of Credit, said in the course of his speech in reference to the situation on the Western Front with regard to Russia:—

As regards guns, it is obvious that the Germans have taken so many in Russia that we may be liable to find that they have a distinct and great superiority, but I do not think that there is in that any cause for serious alarm. The power of artillery is limited, not only by the number of guns, but by the supply of ammunition. I think we have good reason to hope, I believe I might even say to feel confident, that there will be no dangerous superiority on the Western Front from the point of view of guns any more than

from the point of view of men. In this connection I would like to remind the Committee of something they are not likely to forget, that the value you can get out of guns depends largely on the air forces of the two sides. It is an undoubted fact that from the point of view of fighting efficiency we have, I will not say supremacy, because supremacy implies that the other people cannot show themselves, but we have an overwhelming superiority in our Air Service—(cheers)—which will go far to neutralise any evil that may come from the larger number of guns. In this connection I should like to say, what I believe every member of the Committee knows, that the superiority which, after so long a fight, we have still been able to maintain in the air is not due so much, perhaps hardly at all, to superiority of organisation or of flying machines—it is due to the quality of the men. (Cheers.)

In regard to the Air Service, the Committee knows that this Government, as well as the people of this country, were very reluctant to indulge in any air raids on German towns. We put it off as long as we could, but, as was stated in the House a good many months ago—I remember stating it myself at a meeting at the Albert Hall—that just as in the case of poisonous gas, so in the case of air raids, we would never begin them, but that if they must be part of the war we should take care that we do not come worst out. (Cheers.) They have begun. The Germans, like ourselves, do not publish results, but there was a very interesting discussion in the House of Representatives of Bavaria the other day, and I will read part of the report which came to the Government. The House will realise that these raids have not been ineffective. This is what it said:—

"In the House of Representatives there was a social democratic interpellation concerning raid damage. The interpellation says, Is the Government aware that the population of Bavaria has ever-increasing loss from air raids, and what does the Government propose to do to indemnify those who suffer by these raids? Later on a Liberal member requested the Government to use their good offices that an Imperial law should be passed whereby State compensation should be guaranteed for damage by aircraft inflicted on persons or property. The House resolved upon open discussion of his interpellation, and the Ministers stated repeatedly that the Government will do its best to relieve the suffering caused by the air raids."

I think this shows that what we have done in that direction has not been ineffective. (Sir H. Dalziel.—Three years too late.)

\* \* \*

On March 21st Mr. J. F. Hope, replying to Brig.-Gen. Page Croft, said that it had been thought desirable to transfer a number of German officers from the West to the East Coast; but that this was not to be regarded as a measure of reprisal or punishment. The climate of the Kent and Essex coasts was at least as good—(laughter)—and probably better than that of certain prison camps in Germany.

The Chancellor of the Exchequer, replying to Mr. Billing, said the Government were doing everything in their power to make the raids into Germany effective.

Mr. Billing: Is the House to understand that the raids carried out in Germany are considered by the Government legitimate acts of war, and that they will not be discontinued in the event of the enemy squealing upon the point of reprisals? The Chancellor of the Exchequer: The House should understand that they are in our opinion legitimate acts of war. Mr. Pemberton Billing: Will the right hon. gentleman give the House an assurance that under no consideration will the Government be prepared to discontinue such acts of war in enemy countries? The Chancellor of the Exchequer: I shall certainly give no undertaking as to what our actions will be in circumstances that have not arisen.

## SOME R.F.C. FIGURES

On March 20th, Mr. Macpherson, Under Secretary for War, replying to Mr. Joynson-Hicks, said: Since October we have made 38 effective raids into Germany, and we have dropped 48 tons of explosives, a remarkable achievement under the circumstances. The conditions under which these raids have been carried out during the winter have been extremely difficult. In the Lorraine region throughout the winter it is only on rare occasions that flying can be successfully carried out. Low clouds, high winds, rain, and snow are the normal features of the weather in this area, whilst when the weather is otherwise fine heavy mists lie over the valleys and render the location of targets extremely difficult. This is particularly so in the case of the valleys in which the German ironworks and factories are situated. Intense cold has been experienced, machine-guns have been frozen, and there have been several cases of frost-bite. Stress must be laid on the difficulty of finding the way in an unknown country, more particularly where clearly defined landmarks are absent.

Approximately 250 flights have been made in the course of these raids, during which only 10 machines have been lost.

There has been a steady increase in the number of raids carried out and the amount of explosive dropped, whilst the increased distance to which raids have been carried into Germany is most satisfactory. This is particularly so in the case of the recent raids during March, which have so far been eight in number.





# You can have delivery of any of these "Ascol" Specialities NOW

**"ASCOL"** We have now ready a large range of illustrated leaflets dealing with "Ascol" **LEAFLETS.** Specialities. These include "Ascol" Micro-meters, Factory Stools, File Cleaners, Avro Parts (Washers and Eyebolts), Safety Belts, Dope Brushes, etc., etc. The leaflets are supplied in a neat and useful case, and will be sent free to the Industry upon application on business stationery.

## THE AIRCRAFT SUPPLIES COMPANY LTD

CONTRACTORS TO THE AIR BOARD.

Head Offices, Showrooms, and Stores:

**ASCOL HOUSE, 125, LONG ACRE, LONDON, W.C.2.**

Representatives in Birmingham, Manchester, Leeds, Belfast, Northern Counties and Scotland, South Coast and the London District.

Works:  
Little James St.  
London, W.C.1.



Telephone:  
Gerrard 276.  
(Private Branch Exchange.)

MANAGING DIRECTOR

G. H. MANSFIELD.



"ASCOL"  
MICRO-  
METER

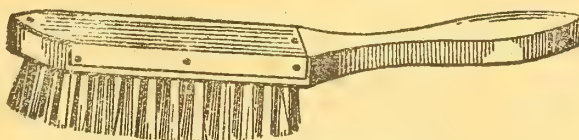
30/- and  
32/6 each.



"ASCOL" FILE  
HANDLES.

2½ in. 3/-, 3½ in. 3/6  
per dozen.

## BRUSHES.



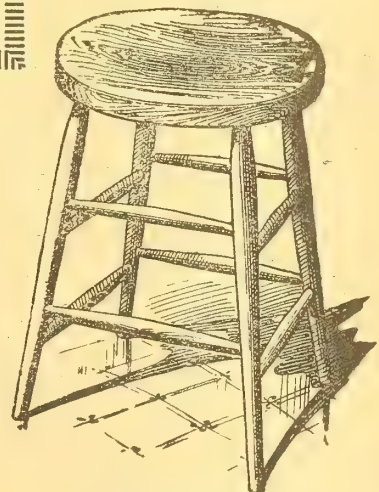
4-row Scratch Brushing (for Burnishing), 16/- per doz.



Engine Brushes. 8/6 and 9/6 per dozen.



Mop Brush, 4/2 per dozen.



FACTORY STOOLS  
(Wood).

24in. high - 6/6 each.



I would point out that the majority of raids by British machines have been carried out in broad daylight, and photographs have been taken of the bursting bombs, placing the accuracy of the reports received of their effect beyond all shadow of doubt. Further, by attacking in daylight it has been possible to concentrate attack on objects of actual military importance, a striking contrast to the promiscuous methods adopted by the enemy.

During the night raids our machines have descended to low heights and fired at searchlights, trains, and railway stations. A steady increase has been observed in the enemy's anti-aircraft defences, the number of searchlights, guns, and aeroplanes. These latter have been defeated with loss whenever they have attempted to intervene. On other occasions our pilots have attacked enemy machines drawn up on the aerodromes preparatory to making bombing raids into France. The following report on a recent raid is typical of the results obtained:—

Detailed Report of Operations carried out March 10th, 1918.—Twelve aeroplanes left at 9.35 a.m. to bomb the railway stations, barracks, and Daimler Motor Works at Stuttgart. Eleven of these machines reached the objective. One machine failed to return, being seen to fire a green light on the return journey, and go down under control, apparently with engine trouble, south-east of Oberkirch.

The following bombs were dropped on the objective with excellent results:—Three 230 lb., 10 112 lb., 9 40 lb. (phos.); total, 2,842 lb.

Several bursts were seen on the Daimler Motor Works and several on the railway lines. Mettingen Station was hit and set on fire. A train which was standing in the station was also set on fire. Two bombs burst near the electric power station in the town, one beside the railway sidings, one near the gas works, and five or six bursts in or around the Gare de Triège. Two bursts were seen by the bridges over the river, and two beside a large munition factory south-east of the town.

A total of 36 plates were exposed at Stuttgart, which have come out very well, and which show bombs bursting on objectives.

Three enemy aircraft attacked our machines over the objective, one being a two-seater and the other two Albatros D.3 type. After the first combat the enemy aircraft followed our machines, shooting at long range, and then withdrew.

The most recent report is to the effect that our bombing machines attacked military objectives at Mannheim on the Rhine on March 18th. Over a ton of bombs were dropped with excellent results. Eight direct hits were obtained on the Badische Soda Factory, causing an abnormally large column of black and white smoke to ascend. Also two bursts were seen on the docks and one on another large factory. The bombers were attacked by two formations of enemy machines, of which two were driven down out of control over Mannheim and the remainder driven off. Our machines all returned safely.

### ARTICLES WORTH READING.

Readers of THE AEROPLANE are strongly recommended to take an interest in "Blackwood's Magazine" for March and the following months. In the current issue there is the first of a series of articles by "Contact," whose book, "An Airman's Outings," is by far the best thing that has yet been done in the way of giving the non-technical person an insight into the workings of the Flying Services. This first article deals with the making of a pilot in "Contact's" usual graphic and humorous manner. Incidentally, one is glad to see that he recommends the aspirant pilot "to read from cover to cover that excellently simple work by Captain Barber, R.F.C., one of the pioneers of aircraft construction, 'The Aeroplane Speaks.'"

His description of the experiences of the unwinged pupil, generically known as a "Hum," is excellent. Incidentally, his description of the vagaries of pupils reminds one that he might have worked in, if he had known it, or has not forgotten it, the despairing instruction of a much-harassed instructor who remarked to a pupil: "You have broken my blinking aeroplanes, you have broken my blinking heart, now for the Lord's sake go and break your blinking neck."

Another excellent thing in the same issue of "Blackwood's" is a continuation of the "H.M.S." articles and poems by "Klaxon," whose splendid "Songs of the Submarine" are already well known to many readers of this paper. "Klaxon's" art seems to improve with practice, and his four contributions in this month's "Blackwood" include two virile poems which are genuine poetry, and two short prose articles which are none the less poetry for being non-metric and very largely written in Navy slang. Incidentally, one judges that "Klaxon" has been associating to quite an extent with Americans of late.

### AT SEA.

It is reported that enemy seaplanes were observed in the southern part of the North Sea on March 18th. The weather was ideal. They attacked British drifters, using their machine guns freely on the small craft, but happily the latter escaped without a casualty. Patrol boats soon came upon the scene, and opened fire, whereupon the enemy beat a hasty retreat.

## A BILLION CAPITAL FOR AIRCRAFT.

### Or How to Make Little Billie Billions.

Some people ask how our publicans are helping to win the war. This is an easy question to answer. Before the war the publican sent his sons to the far ends of the earth; this was good for the Empire. Now he is equally patriotic, he charges double price for whiskey which is half water; this tends to the sobriety of the nation, and the surplus shakels he collects, he can, perhaps, invest in aircraft manufacture.

One of these outposts of Empire when war broke out was Mr. Swelldead, now Chairman of that mighty, flighty proposition, "Swelldead Aircraft, Limited." He was holding the highly important post of Chief Domestic Engineer to the Court of the Black Prince of Swankopmund in South Africa.

Every moment he could spare from repairing the mangle, the sausage machine and the knife-cleaner was devoted to thinking pregnantly. Gazing on the home farm of ostriches one day a sudden rush of brains to his head brought forth the brilliant idea that where nature had thoughtlessly omitted to give the noble birds full propulsive powers it was possible (D.V.) for a man like Swelldead to step in where Providence had feared to tread, and endow the providers of feathery joys for the donahs of East London with the means to soar into the Empyrean.

A little cogitation over a pipe of tobacco (B.D.V.), and soon thereafter the cock bird of the flock was taxying about as a pusher monoplane. Further experiments produced a fleet of tractor monoplane hens. The motive power, however, was not sufficient to do more than impart a switch-back motion to the Black Prince's poultry.

It is at moments like this that a man like Mr. Swelldead rises to his opportunity, and a plan for imparting a rotary motion to the parsons' noses of the birds was just reaching maturity when the Dusky Monarch discovered that the State umbrella had provided ribs and wings for his champion feather-weights, and at the same moment the world war broke out.

At times like these men like Mr. Swelldead do not hesitate. His not to remain and argue why the State umbrella was helping ostriches to climb the sky. His place was at home within reach of the billions. The fleshpots of Swankopmund, the pleasant warmth of the African Court, the broad smiles of the dusky beauties, all, all were forsworn. For such a man as Mr. Swelldead, laborious days, the plain Rolls Royce, the silent fur coat and the simple chop at the Carlton were to suffice, almost, until the war was won, or until the guinea pigs began to fly. The people of Britain know how he returned nominally a naturalised Swankee, actually at heart a full-blooded Britisher.

His beginnings in aircraft work were modest, but his stock of modesty was soon exhausted, and now the dictionary has not sufficient superlatives to describe his activities.

One of his achievements was the discovery of Mars. Then Mars immediately soared to a higher pinnacle than ever before; then, and not till then, did Britons appreciate the full flavour of that glorious old poem of Dr. Swotz:—

Twinkle, twinkle, little Mar,  
How I wonder what you are,  
Up above the world so high,  
Like a biplane in the sky.

Fishpond, Surrey, was the fortunate spot where this determined Swankee decided to raise the wind to the correct velocity for ideal aircraft navigation. To this end he installed a gigantic hot air plant, the magnificent effects of which are now apparent to the wondering myriads in the stupendous works of Swelldead Aircraft, Ltd., and others.

As its name denotes, Fishpond had from the days of prehistoric peeps one drawback. Cold feet were common there, because its well-known common, covering millions of acres, or less, was damp with innumerable watery homes of the stickle-back and the tadpole.

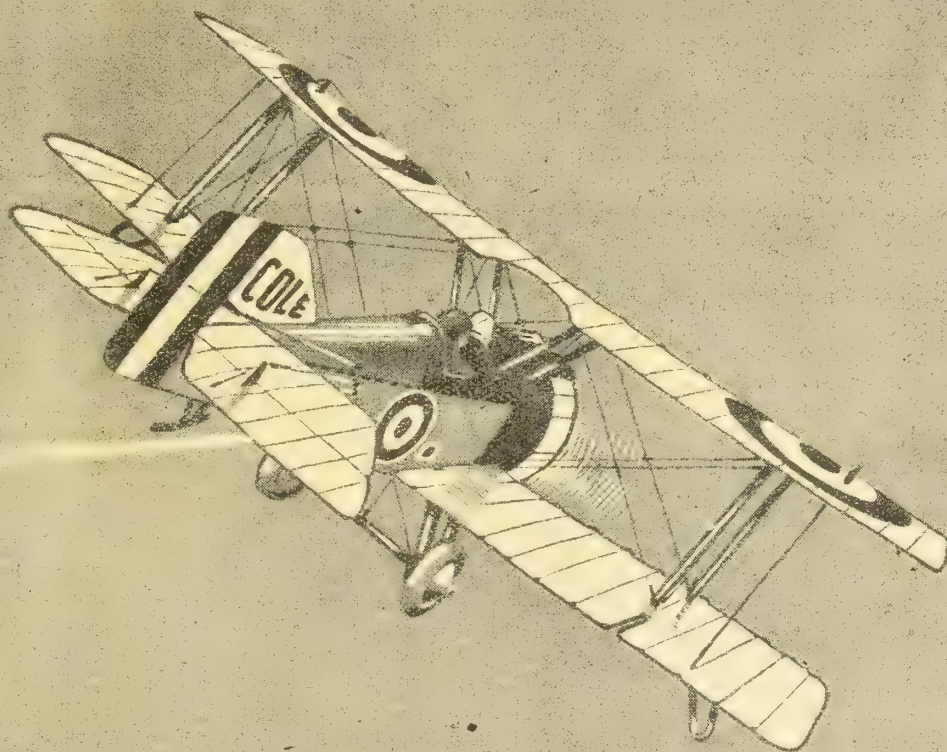
Natural drawbacks, such as these, were only made for men of Mr. Swelldead's determination to conquer; before breakfast one morning he saw a solution of this great problem, after lunch at the Carlton with Lord Bottomcliffe he saw several.

Suffice it to say that in a trice the fish ponds were removed, en bloc, presented gratis to a grateful Government, and spread to a level depth of an extra foot over the great seaplane harbour at Blankstone, thereby ensuring that really safe landing which the Admiralty authorities had so long desired.

Need we say more? Men like Mr. Swelldead and firms like Swelldead, Aircraft, Limited, rise to immeasurable heights, descend to unfathomable depths, and, transcending all the limits of time and space, will find their proper level in eternity; so lay up your treasures not in concerns where moth and dust corrupt, but in the firm that is prepared to provide the angels with reliable flying outfits. Any patriot requiring further amusement can write, Grave 2B, Nirvana, Woking.

A. D. V.





# COLE AIRCRAFT

**Wm. Cole & Sons, Ltd.**

Aircraft Manufacturers.

Contractors to H.M. Government.

*Works:*

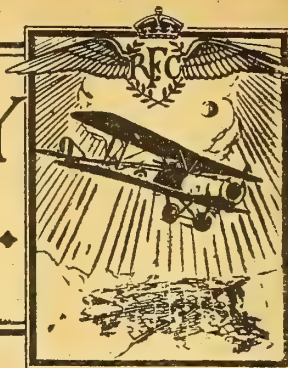
**235, Hammersmith Road, LONDON, W.6.**

Telephone—Hammersmith, 14134.





# NAVAL *and* MILITARY • AERONAUTICS •



FROM THE "LONDON GAZETTE."

WAR OFFICE, March 18th.

With reference to the awards conferred as announced in the "London Gazette" dated October 27th, 1917, the following are the statements of services for which the decorations were conferred:—

## THE DISTINGUISHED SERVICE ORDER.

Sec. Lt. A. P. F. RHYS-DAVIDS, M.C., R.F.C., Spec. Res.

For conspicuous gallantry and devotion to duty in bringing down nine enemy aircraft in nine weeks. He is a magnificent fighter, never failing to locate enemy aircraft and invariably attacking regardless of the numbers against him.

## A SECOND BAR TO THE MILITARY CROSS.

LT. L. M., BARLOW, M.C., R.F.C., Spec. Res.

For conspicuous gallantry and devotion to duty in aerial combats. In the course of a fortnight he destroyed several enemy machines; on one occasion he attacked four enemy scouts and shot one down in flames, and two others, which were seen to crash. He showed the greatest gallantry, dash, and skill.

## A BAR TO THE MILITARY CROSS.

Sec. Lt. (Temp. Lt.) R. T. C. HOIDGE, M.C., R.G.A., Spec. Res. and R.F.C.

For conspicuous gallantry and devotion to duty in shooting down 14 enemy aircraft in three and a half months. After attacking a large formation of enemy aircraft, owing to engine trouble he was driven down to 500ft. at least five miles from our lines, but managed to recross the lines at a height of 500 ft. and so saved his machine.

Sec. Lt. (temp. Capt.) J. T. B. MCCUDDEN, M.C., Gen. List and R.F.C.

He took part in many offensive patrols, over 30 of which he led. He destroyed five enemy machines and drove down three others out of control. He showed the greatest gallantry, dash, and skill.

LT. A. E. MCKEEVER, M.C., R.F.C., Spec. Res.

For conspicuous gallantry and devotion to duty in aerial combats. He has recently destroyed five enemy aeroplanes and driven down six out of control. On one occasion he encountered five enemy scouts, and drove down two out of control. Later, while leading a patrol, he engaged nine enemy scouts. He destroyed two, drove down one out of control, and dispersed the remainder. His dash and determination have been a fine example to his squadron.

Sec. Lt. K. R. PARK, M.C., R.F.A. and R.F.C.

For conspicuous gallantry and devotion to duty in accounting for nine enemy aircraft, three of which were completely destroyed and six driven down out of control.

Sec. Lt. A. C. YOUNDALE, M.C., R.F.C., Spec. Res.

For conspicuous gallantry and devotion to duty in attacking enemy troops from an extremely low altitude. On one occasion he attacked from the rear, from a height of about 150 ft., the enemy that were holding up our infantry.

## THE MILITARY CROSS.

Temp. Sec. Lt. R. H. AYRE, Gen. List and R.F.C.

During a period of five months he took part in many successful bombing raids. On one occasion he bombed an enemy airship shed, and on another occasion bombed a railway station from a height of 500 feet. He derailed part of a train, and then engaged the occupants with machine-gun fire. He displayed the greatest gallantry and determination.

Sec. Lt. (Temp. Capt.) C. A. BREWSTER-JOSKE, Gen. List, and R.F.C.

For conspicuous gallantry and devotion to duty in taking part in 29 air fights, in which he has destroyed seven hostile machines.

Sec. Lt. (Temp. Lt.) J. H. BROADWAY, Dors. R., Spec. Res., attd. R.F.C.

For conspicuous gallantry and devotion to duty. He attacked a party of six enemy machines, driving one down over the enemy's lines. He has always set a splendid example of courage and devotion to duty.

Temp. Sec. Lt. G. W. FERGUSON, Gen. List and R.F.C.

As pilot in an artillery squadron, whilst on artillery observation, he was attacked by several hostile machines, two of which he drove off, the remainder breaking off the combat. Again, whilst on artillery patrol he attacked and drove down an enemy machine out of control. On a third occasion, while engaged on artillery work, observing a party of enemy infantry, he dived on them, firing, and sent a wireless call to the artillery, which opened fire. This officer has shown exceptional capabilities as an artillery pilot, frequently carrying out his work at a low altitude, observation being otherwise impossible owing to low clouds.

Sec. Lt. (Temp. Capt.) A. GRAY, Arg. and Sutthd. Highrs., and R.F.C.

He took part in many successful operations over the enemy's lines, in over 20 of which he acted as leader. On one occasion when leading a bombing raid, his formation was heavily attacked by enemy aeroplanes. He shot one of them down, and brought back the whole of his formation safely. He also led a successful raid on an enemy aerodrome, and on several occasions obtained valuable photographs. He has accounted for two enemy aeroplanes, with his front gun, and always showed great coolness, ability, and resource.

Temp. Sec. Lt. R. F. HILL, Gen. List and R.F.C.

He has carried out a great deal of useful observation work, and has proved himself an excellent fighting observer. On one occasion, when acting as observer on a photographic reconnaissance, he and his pilot shot down and destroyed two enemy scouts. He has also destroyed three other hostile machines.

Sec. Lt. C. F. HORSLEY, Norf. R. and R.F.C.

While on a photographic reconnaissance he was attacked by eight enemy aeroplanes, and after a fight which lasted over 20 minutes drove down two of the enemy. On another occasion he took part in an encounter between six of our machines and 25 enemy aeroplanes, in which he displayed great coolness and skill in driving off the attacking enemy. He has led many successful photographic reconnaissances, and on several occasions has been attacked by superior numbers of the enemy.

Temp. Capt. LEACROFT, Gen. List and R.F.C.

On one occasion he flew at a very low altitude in extremely bad weather and successfully engaged enemy troops with machine-gun fire, and on another occasion carried out a most valuable reconnaissance and engaged enemy troops from a height of 100 feet. He destroyed two hostile machines, and has proved himself a courageous and determined pilot.

Temp. Lt. H. G. E. LUCHFORD, Gen. List and R.F.C.

He has carried out a great deal of extremely useful work, and has proved himself a capable and determined leader. On one occasion when on a photographic reconnaissance he and his observer shot down and destroyed two enemy scouts. He has destroyed five other hostile machines.

Sec. Lt. (Temp. Lt.) F. L. MCCREARY, S. Lanc. R. and R.F.C.

When his machine was attacked by a hostile scout in a thick mist the pilot was killed instantly, and the machine started going down with the enemy machine still following. Though wounded in the hand he drove the enemy machine off with his machine gun and got the machine under control. He brought it to within 200 ft. of the ground when it crashed within a mile of his aerodrome. Although wounded and much shaken he proceeded to his corps headquarters and made his report. He showed great coolness and skill.

(Continued on page 1193.)





# AIRCRAFT MANUFACTURING COMPANY———LIMITED

**Contractors to**  
**War Office and Admiralty**

**London Office**

**27, BUCKINGHAM GATE, S.W.1.**

**Offices & Works**

**HENDON, N.W.9.**



**WOODSIDE ENGINEERING COMPANY, LTD.,  
POSSILPARK, GLASGOW.**

# **AEROPLANE TIERODS**

: IN :

**STREAMLINE AND ROUND SECTIONS**

**COMPLETE WITH**

**UNIVERSAL OR FORK JOINTS**

**LARGE STOCKS.**

**PROMPT DELIVERY.**

**Telephones.**

**WORKS: 1495 Douglas (2 lines.)**

**OFFICE: 3456 Central (3 lines.)**

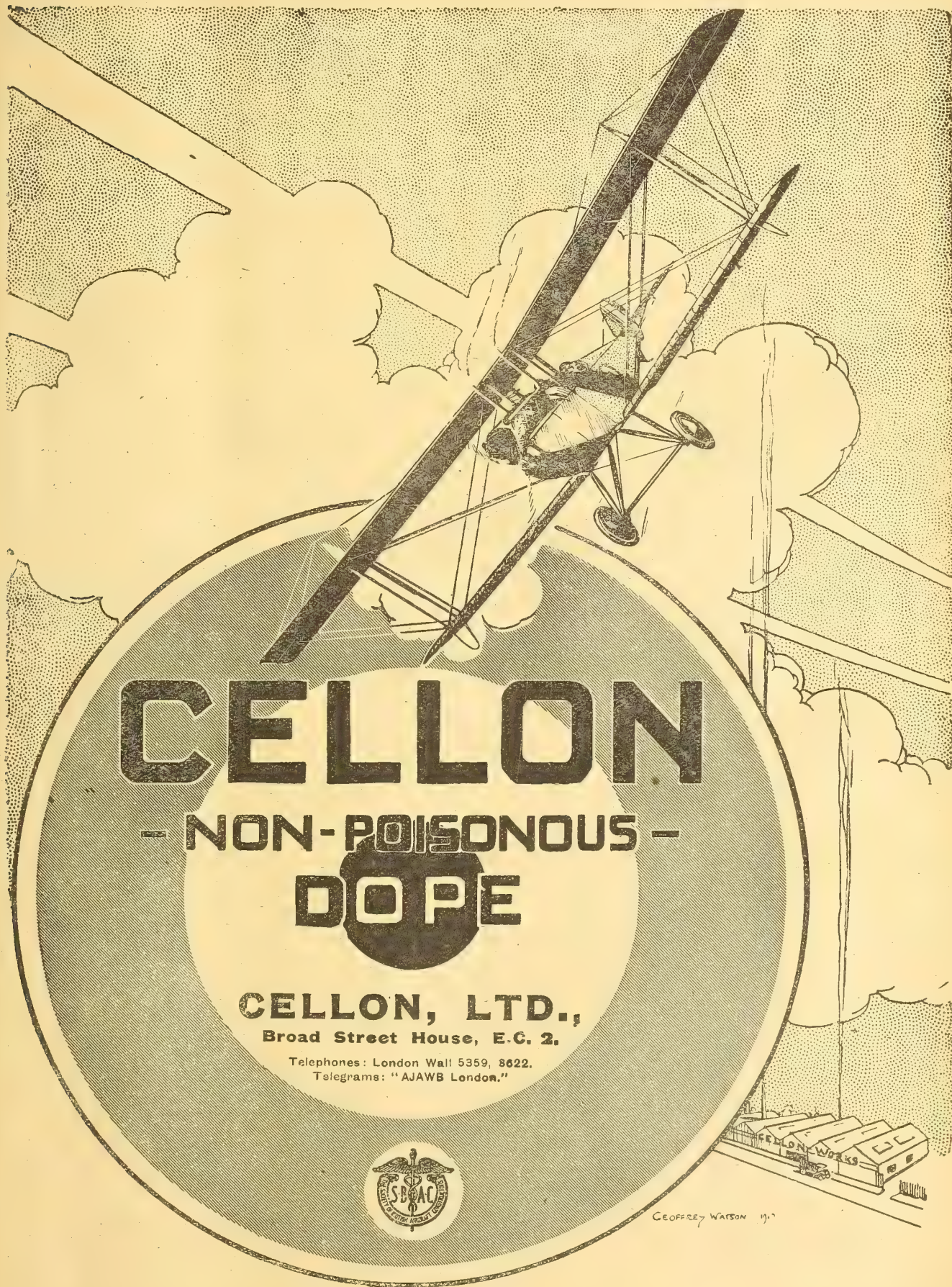
(Private Branch Exchange.)

**Telegrams: "FUSELAGE," GLASGOW.**

**Registered Office**

**50 WELLINGTON STREET  
GLASGOW.**





**CELLON**  
- NON-POISONOUS -  
**DOPE**

**CELLON, LTD.,**  
Broad Street House, E.C. 2.

Telephones: London Wall 5359, 8622.  
Telegrams: "AJAWB London."

**CELLON WORKS**

GEOFFREY WATSON 1918



“ “ CONTRACTORS TO “ “  
HIS MAJESTY'S WAR OFFICE

*Messrs. Gordon Watney & Co. Ltd*

**AERONAUTICAL AND  
GENERAL ENGINEERS  
South Lodge Motor Factory  
WEYBRIDGE**



Telephones WEYBRIDGE 550 (7 lines),      Telegrams: "MERCEDES, WEYBRIDGE."



# AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

INCORPORATING AIRCRAFT ENGINEERING, AERODYNAMICS, AND MATTERS PERTAINING TO THE AERONAUTICAL ENGINEER AND THE AIRCRAFT TRADER

## The British Aircraft Industry.

(SECOND SERIES.)

BY R. P. HEARNE.

### IX.—ACCLES AND POLLOCK, LTD.

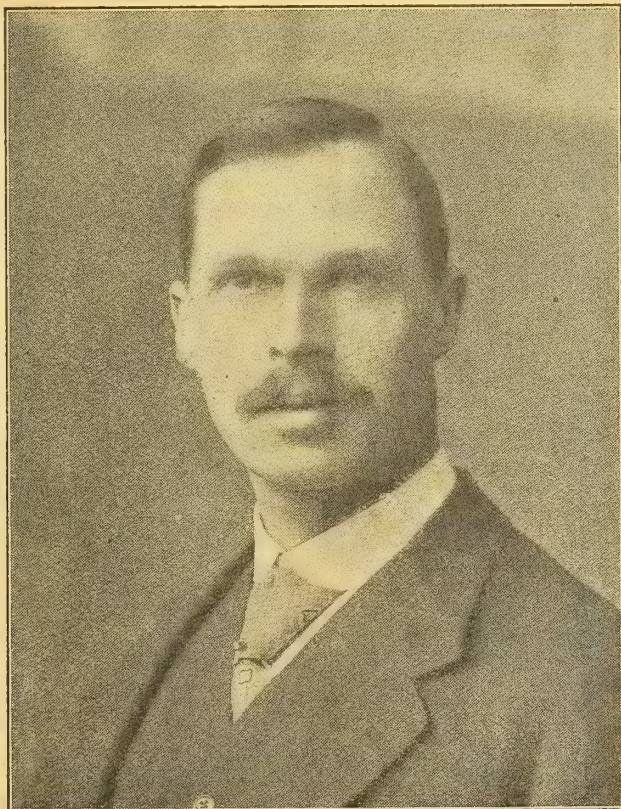
#### EARLY INFLUENCES.

In a previous article I hinted at the close and curious relationship which existed between the bicycle and the aeroplane, and I showed that many of the men interested in the former type of vehicle were attracted also to the latter. There is yet another aspect of the affair to touch upon, namely, the influence of cycle engineering on aircraft engineering.

We never really knew the possibilities of what I may call feather-weight engineering until the bicycle opened up the matter

weight racing bicycle. This instrument, weighing under 20 lbs., was able to carry a full weight and powerful man, to take the fierce reciprocal thrusts of his muscular limbs, and to translate them into circular motion at unheard-of speeds.

The steel tube made the modern bicycle possible, and in doing this it led the way in that evolution of mechanical locomotion which has brought us to the aeroplane. Of course we know that the steel tube has not held the field in motor-car construction, and we know, too, that it is not the vogue in aircraft construction to-day; but, none the less, the steel tube has played a very important part in bringing the motor-car and the aeroplane



Mr. C. T. Barlow.

for us. The old-time engineer was a great believer in solidity and strength, and the early bicycles had both these virtues developed until they became vices. Then the human motor rebelled, for we found it very tiresome to propel or even push heavy masses of metal. One converted the engineers themselves by compelling them to ride their own bicycles.

#### THE CULT OF LIGHTNESS.

An insistent demand came for lightness, and by a very remarkable development in experimental engineering we arrived at one of the most marvellous structures ever built by man—the feather-



Mr. W. W. Hackett.

to us, and in many respects it continues to be of the utmost importance in both these branches of engineering.

Nor must it be overlooked that the future may have big surprises in store for us in aircraft building. Indeed, if it were advisable for me to survey every branch of aeronautical engineering and trace the uses of metal tubing at present, the result would astonish most people. But the moment is not appropriate.

#### THE PIONEERS OF SPECIAL TUBING.

A pioneer firm in the production of metal tubing of specially high grade is Accles and Pollock, Ltd., of Oldbury, Birmingham.



ham. They led the way in giving us the light and strong tubing, made of special high-carbon and nickel steels, which made British bicycles world-famous, and they have helped in many ways to bring forward the motor and aeroplane industries.

Under the joint direction of Mr. C. T. Barlow and Mr. W. W. Hackett this old-established house has been most enterprising in finding new uses for their products, and they have rendered very great assistance to the pioneers in many branches of industry. In fact, when anyone mentions "steel tube," one automatically thinks "Accles and Pollock," just as one thinks "Pears" when anyone says "soap."

#### EARLY AIRCRAFT EXPERIMENTS.

Leaving aside what they have done as regards motor-bicycles, motor-cars, and light cars, I might point out that even before the Wright Brothers had made their genuinely successful flights the firm of Accles and Pollock were helping British experiments in aircraft work.

It is easy for critics of to-day to assert that most of this work of the early days was wild-cattish and freakish. But I take my hat off to every one of the men who at that period strove to solve the problem of human flight. And it redounds to the credit of Accles and Pollock that they went out of their way to assist these experimenters by giving them suitably light and strong tubular structures for the helicopters and other strange aerial machines which they then attempted to produce.

I know enough about these early aircraft inventors to say that the business they brought to a firm was not very easy or very profitable. It required a great deal of tact and patience and not a little human kindness to bear with some of the poor fellows who were groping blindly. But our progress is built as much on failures as on success, and the longer I live the more sympathy I feel for the men who tried—but failed.

#### THE FIRST SERIOUS EFFORT.

The first serious effort at aircraft work on a large scale was made by Accles and Pollock, Ltd., in 1908, when a well-known naval officer approached them with a scheme which he had for building a large tandem biplane. This idea was worked out and carried through at the Oldbury Works, and the magnitude of the design for those days will be apparent when it is stated that the span of the machine was about 60 feet, the length about the same, and the weight almost a ton with engines.

There were many novel features in the machine, the chief one being that the frame was composed of vast hoops made of light gauge oval tubing, very difficult to draw straight, and still more difficult to draw in hoops, as the works managed to draw it, without a kink anywhere. Over one and a quarter miles of tubing were used in the structure, and the machine carried twin engines, driving two 12-foot tractor screws.

From various causes the machine was not a success, and I need hardly say that most of the big machines built at that time were not a success. The main reason was that they were before their day, and another reason was that our knowledge of the thousand and one things which govern success in large-scale aircraft structure had not then been properly sorted out or applied. But I say with full emphasis that every experiment, and possibly every freak, fulfilled a useful purpose, for they were all part of our common education and progress.

#### THE LESSONS OF EXPERIENCE.

The experience gained by the chiefs of Accles and Pollock, Ltd., and by the inventor of the machine which they built proved most valuable to both, and judged merely as an engineering structure the machine did them great credit. At the time it was the

### THE EMPLOYER'S VIEW.

The following letter from a large employer is of importance:—

With reference to aircraft firms "piling the profits up," as the workman says, he is talking without his book absolutely. Of course, you know full well that what you do during war matters little, the important thing is the *pre-war standard*. This is all the Government take into consideration, consequently aircraft and similar firms, having no pre-war standard, cannot make any money at all. Unfortunately, the workman does not believe this, but goes on the number of aeroplanes the firms are at present turning out and thinks they are making a fortune.

With regard to dilution, the A.S.E. are trying to run this country. What you say is true—some of the newcomers are doing considerably better than the old A.S.E. men. Our leading tool-setter on automatic machines was a jeweller all his life.

You are quite right when you state that the so-called rich people are much worse fed than the so-called poor. Our work-people eat once a day here—that is, from nine o'clock in the morning until five o'clock at night—and waste food, and throw it about in the shop in a manner that is nothing short of disgraceful. Where they get it from is a mystery to me. I cannot.

I consider the chief trouble with the workmen to-day is *lack of international intelligence*. They will not believe what the Germans and Americans are doing with regard to output.

largest aeroplane built, and it was the first all-steel machine ever constructed.

We may or may not get to the all-metal aeroplane as a practical proposition, but I still cling to the idea that before the last word is said (if it ever be said) in aircraft building we shall use metal to a far greater extent than at present.

As a result of their work with this tubular machine Accles and Pollock, Ltd., were called upon for help in various directions by many experimenters and inventors. A considerable amount of research work was carried out by the firm as regards tubing. By reason of this they were able to speak with authority concerning the use and abuse of tubing in aircraft work, and thus they were of great assistance to the whole aeronautical movement. The value of this assistance has grown tremendously since the war broke out.

#### TO-DAY'S REWARD.

To-day this branch of their activity is in a very highly developed state, and a well-equipped laboratory, a test room, and scientifically equipped and arranged muffles enable the firm to be of considerable service to the Government and to the Aircraft Industry in numerous ways which I need not specify.

In passing I may mention that it was Accles and Pollock, Ltd., who partly designed and carried out the tubular work for the Willow's airship, of which we have kindly memories. This little dirigible, after a varied career, was taken over by the Government, I believe. Looking back on the circumstances under which it was built and used, one has but all the more admiration for the pioneers of aeronautics in this country.

#### A PATTERN OF ENTERPRISE.

Certain it is that if we had had more industrial and commercial enterprise of the kind displayed by the directors of Accles and Pollock, Ltd., the path of our aerial pioneers would have been easier. It is all the more pleasing then to find that the interest of this house in aviation has brought its reward.

At all events, it has not prevented them from building up a gigantic business. Their large tube mills are always very busy, and the various manipulation shops for bending, trapping, brazing, polishing, welding, soldering, and otherwise treating the tubes, etc., give a good idea of the utility and wide application of the metal work which they produce.

#### BITS AND PIECES.

It might be thought that apart from tubing the material which they handle had little to do with modern aircraft construction, but the existence of their large aero department shows how wrong this impression is. Built-up rudders, fins, and numerous minor structures, in which steel pressings are used in immense quantities, show clearly that tubing and metal press work play very important parts in the machines of to-day.

Various ingenious contrivances have been brought into use to facilitate the production of these articles, and a large staff of expert tool and jig makers is constantly employed to deal with the necessary tools and appliances. Draughtsmen trained specially for this industry work out many new designs, not a few of which are applicable in one form or another to aircraft requirements. So there is an ever increasing use of tube work.

Accles and Pollock, Ltd., and their energetic Managing Directors, Mr. C. T. Barlow and Mr. W. W. Hackett, have gone a long way in the new industry of aeronautical engineering, and the unique experience which they have gained in their own department gives them all the more confidence in the future. Even if the "all-metal" structure does not come into use it is certain that there will be a constantly growing use for specialised metal parts, of many of which this British firm can claim the honour of being the originators.

### GERMAN WAR PROFITS.

According to the "Daily Mail" the "Frankfurter Zeitung" of March 10th publishes details of the munitions profiteering scandal, which has caused the War Office to place the great Daimler Motor Company, of Stuttgart, under military control. These are the most notorious facts already revealed:

Asked by the War Office to justify inordinately high prices, the company submitted fraudulent calculations.

In 1916, though the company's gross capital was only £400,000, profits were £619,000, as compared with £167,000 in 1913.

Dividends rose from 14 per cent. in 1913 to 16 in 1915: 28 in 1916, and 35 in 1917.

Meantime reserve rose from £275,000 to £400,000, and the entire "plant," previously standing in its books at £265,000, was written off to 1s.

In 1917 the capital was quadrupled to £1,600,000, shareholders receiving a present of three new shares for every one already held.

Despite its gigantic profits, the Daimler Company (with other German motor works) demanded a 25 per cent. increase on all munition supplies, and threatened to close down its entire works unless the increase was granted.

The "Frankfurter Zeitung," which has been crusading against the Industrial Junkers' usury, declares that the Daimler scandal, while possibly the most glaring case, is by no means isolated.



*Britain Supreme in the Air!*

# ROLLS-ROYCE AERO ENGINES

like Rolls-Royce Cars are the best in the World. By their wonderful achievements they are making Britain and her Allies Supreme in the Air.

*Describing the historic flight from London to Constantinople in thirty hours the "Autocar" says:*

"The fact must be recorded that the Engine never failed for a moment throughout the entire journey to Constantinople. Great therefore as was the reputation of the Rolls-Royce Engine before the flight, the epic achievement described added new laurels to its wonderful career."

# ROLLS-ROYCE

Contractors to H.M. Government.

LTD.

14 AND 15, CONDUIT STREET, LONDON, W.C. 1.

Telegrams: 'Rollhead Reg, London.'

Telephones: 1654 Gerrard (8 lines)

AND AT DERBY, PARIS, NEW YORK, MADRID, BOMBAY, ETC.



## Co-operative Research.

THE MEANS OF ORGANISING AND FINANCING AERONAUTICAL RESEARCH, AND THE ADVANTAGES LIKELY TO ACCRUE TO THE AIRCRAFT INDUSTRY FROM CO-OPERATIVE ACTION.

BY "DIOGENES."

### V.—SUNDRY CONSIDERATIONS AND CONCLUSIONS.

It is quite conceivable that some of my readers, if there remain any who have had enough patience to wade through the rather dry matter contained in these articles, may have been struck by the idea that very many of the arguments in favour of joint research might equally well apply to research by individual concerns, and that the latter method, while more expensive, would perhaps be correspondingly more beneficial to the firm that undertook it. In reply to any such view I would urge that this is a question which has got to be looked at upon national rather than upon private grounds.

The idea is to put the British industry ahead of others. This is a process which, if it succeeds, must necessarily benefit the members of that industry. It is not every country that can manufacture aeroplanes, and many of those which could make the best and most immediate use of civilian air services, owing to the inadequacy of roads and railways, are the very ones that cannot manufacture at all. If we are to get this business, we must be ahead of our competitors.

#### SELFISH RESEARCH.

Individual research may put a single firm ahead of its neighbours, but is not a really efficient means of improving the position of an entire industry. If twenty firms collaborate for research, and any valuable results obtained are shared by all of them, then those results have twenty times as big an effect upon the industry as would have been secured if one firm had obtained them and kept them for itself. Individual research generally leads to one design being particularly good in some one special respect, and another in another respect. Equal expenditure on joint research should ultimately make all designs specially good in all respects. Incidentally, it encourages standardisation so far as standardisation can be wisely applied in a young industry.

If joint research were to show the desirability of the general adoption of some particular device, then presumably the firms in the industry would not each provide that device quite independently, but would standardise the device and place the orders for its manufacture so that they would get the benefit of the low cost due to production in quantity. I do not think that it is necessary to labour the advantages of joint as against individual research. The few remarks put forward should be sufficient to suggest a line of reasoning which will be conclusive in favour of collaboration.

Once we recognise the advantages of collaboration, we must not limit their application in an arbitrary manner. Many industries and branches of industry are going in for joint research. Overlapping is almost unavoidable, but the duplication of expenditure for the purpose of obtaining the same knowledge can be avoided by proper co-ordination.

#### THE DEPARTMENT'S DUTY.

This is where the Department of Research would come in. It will require every Research Association to notify it as to its intended programme. The Department will then be able to compare these programmes and to see just where they overlap. Its approval of the expenditure of public money on the programmes in question will then presumably be contingent on the Research Association undertaking to collaborate where this course appears desirable.

By all means let us have our own independent Association. But if, for instance, we wish to investigate certain qualities of steel that are equally interesting to the motor and the cycle industries, it would be absurd for all three industries to conduct the same experiments in three different places. One research would serve the purpose of all, and the cost of that research could be shared. Examples in which this course would be obviously desirable will occur easily to anyone.

In effect, it is clear that if the Research Department did not exist as a central co-ordinating body, the industries would have to establish some such body for themselves and give to that body supervisory powers, practically equivalent to those claimed by the Research Department.

#### LEAKAGE TO RIVALS.

Now we come to a very delicate point. How are we going to secure that the results obtained will be utilised only in the interests of those who have paid for them? It is to be feared that complete security is not obtainable. We cannot all tie down our designing staffs in such a way as to prevent men from leaving one job for another.

If a designer has been made acquainted with the results of

research, and subsequently severs his connection with the British industry and joins some foreign firm, he cannot very well wipe the knowledge obtained through the Research Association out of his brain; and, failing his ability to do this, he is pretty certain to utilise it. Moreover, if results are really important, there are, no doubt, people with foreign interests behind them who will spare no pains to tap those results, by making it worth the while of somebody who possesses them either to join a foreign firm or to reveal information given him in confidence.

#### THE SECURITY OF PATENTS AND DESIGNS.

In some directions security can be obtained by patenting inventions or registering designs. In other cases this is impossible. One cannot effectively patent a principle, but only specific methods of applying it. It might be helpful if the articles of association provided for a heavy penalty in the event of any unauthorised disclosure of information being clearly traced to any member.

The member would have to protect himself in a similar way in his contracts with those of his employees to whom the information would have to be communicated. In spite of everything there is no doubt that a great deal of the information obtained will gradually leak out and become public property, if only because the designs based upon it will reveal the principles which underlie them. The position, then, appears to be that in some directions the member of such an Association will get a definite advantage in the form of a right to use patented designs, and in others will at least get the advantage of receiving suggestive information some time before it will reach those who do not share in the cost of getting it.

The point appears to be that, if we ourselves can benefit, on the whole, more than anyone else by supporting joint research, then we must not refrain merely because others will benefit also to a lesser extent. All who are acquainted with the British business man must be familiar with the type of mind which leads a man to refuse to take part in some deal, not because he will fail to benefit, but because somebody else will benefit also. This dog-in-the-manger attitude is no good to the British Industry as a whole, and certainly must not be adopted in this matter.

#### LATE ARRIVALS.

There is at least one other point which will have to be carefully considered in framing the articles of a Research Association. This is to provide for the case of a firm which refuses to join the Association in the first instance, but decides to do so only after the Association has done a lot of useful work and consequently when an immediate return is available to new subscribers. The point is that, in an Association of this kind, the new member gets the benefit of all the money that has been spent by elder members before his arrival.

A research might take a year or two to complete. A firm subscribing for the first time at the beginning of the third year would be on the spot when the results were distributed. Consequently it might occur to some rather parsimonious or mean people that it would pay to wait and let others do the pioneering work, and then to come in later on, only if the results appear to be thoroughly promising.

In all probabilities the best arrangement would be to provide that no entrance fee should be payable by original members, but that firms joining later on should pay an entrance fee, which should certainly not be less than the subscriptions that they would have paid if they had joined at first. Probably it ought to be a little more, because it will be the first-comers who take what risks there may be of failure.

As a basis for discussion I suggest, however, that the entrance fee payable by all firms shall be the amount of subscription which would have been due from that firm in the period that has elapsed between the date of registration of the Association and the date of election of the firm to membership, subject to the limitation that the entrance fee shall never be greater than the subscription which would have been payable during the four years immediately preceding the date of election of the new member.

This may strike one as rather a stringent provision, but a little thought will, I believe, lead to the conclusion that, as a matter of fact, it is quite fair. Obviously the late-comer cannot be let in on the ground floor.

At this point I will close, for the time being, what I fear has been rather a rambling series of notes, which may, nevertheless, contain the germs of a few suggestions that may help to bring about the early and successful formation of a Research Association for the Aircraft Industry.



# FOR BUILDINGS OF WIDE SPAN

---

Up to 150 Feet

---

---

**FAIRBY**  
**Construction**  
**Company Ltd.**

---

*SPECIALISTS in all CLASSES  
of AIRCRAFT BUILDINGS*

---

---

**317 HIGH HOLBORN**  
**London, W.C. 1.**

Telephones : { 1875 } Holborn.  
                  { 1876 }

Telegrams : " Bizzibild, London. "



**THE HISTORY OF DOPE.**

The following letters are of interest:—

SIR,—With reference to the above article appearing on page 837 of your issue of the 27th ult., as to who first applied cellulose solutions to aircraft fabrics, perhaps you will allow me to add the following remarks on this subject:—

The question of priority in the use of cellulose solutions for doping aeroplanes has long been the subject of controversy on the rival claims of Dr. Eichengrün and Dr. Austerweil, and has recently (in 1916) been taken up again in the German technical Press. It can be safely said that the discovery of the tightening effect of cellulose solutions on aeroplane fabrics was not made by either Dr. Austerweil or Dr. Eichengrün.

This tightening effect was known to Octave Chanute as early as 1903; and in the "Aérophile" of March, 1904 (pp. 60 to 63) G. Blanchet gave an account of gliding experiments made in the United States (with photos taken by Chanute) and gave instructions for making gliders and treating their fabrics.

The following is a translation of part of the article:—

Secure the fabric along the front edge and pull it very smoothly, folding it over the wire which joins the ribs at the back, and fastening it with pins. Thereupon apply two layers of varnish, which glues the over-lap and contracts the fabric in such way that it becomes as tight as a drum. The varnish used is made by dissolving 60 grms. of gun cotton (moistened with alcohol) in 1 litre of alcohol and 3 litres of ether, 20 grms. of castor oil and 10 grms. of Canada balsam being added.

From this article it was presumably well known in 1903 that fabric tightened when doped with nitro-cellulose solution. It might be argued that a glider is not the same as an aeroplane, but, after all, a glider is practically an aeroplane minus the motor, and it should be recalled that in 1903 the brothers Wilbur and Orville Wright made flights of about a minute.

In 1905 the invention of producing the first commercially valuable cellulose acetate—namely, the so-called acetone-soluble cellulose acetate—was made independently by Dr. Eichengrün (and his collaborators Drs. Guntrum and Becker) in Germany and (by a different process) by Mr. J. W. Miles in the United States, whose German rights were later on acquired by the Bayer Company.

In 1907 Dr. Eichengrün exhibited before a meeting of chemists the first acetone-soluble cellulose acetate produced on a manufacturing scale and showed fabrics coated with this product.

There can be no doubt that Dr. Eichengrün was the first to use acetone-soluble cellulose acetate solutions for coating, water-proofing, and tightening fabrics on a commercial scale. This can be proved from the literature.

As regards the question who first suggested cellulose acetate solutions for aeroplanes in France, which in the article over the signature of Mr. Bayley has been attributed to Dr. Austerweil, with the qualification that Müller in the same year suggested cellulose acetate in the form of films for fixing aeroplane canvas, it should be mentioned that in the French patent 410205 of Mr. Max Müller, which was filed on December 10th, 1909, claiming the priority of December 10th, 1908, a process for coating flying machines, dirigibles, aeroplanes, etc., is claimed employing acetone-soluble cellulose acetate varnishes for making the fabric air and water tight.

It was recognised by the French Law Courts that the use of cellulose acetate solutions for coating aeroplane fabrics or for coating fabrics generally was suggested by Müller and Eichengrün earlier than by Leduc Heitz and Cie., which firm was not founded until September 24th, 1910, by Dr. Austerweil.

Early in 1910 Dr. Eichengrün suggested the use of cellulose acetate solutions for doping aeroplanes, and such solutions were first used in Germany by the Albatros works, and also by Harlan and Rumppler.

Early in 1911 Mr. Wallace Barr became connected with Cellon, and in this connection reference may be made to THE AEROPLANE of September 14th, 1911, where attention was directed by Mr. Wallace Barr, under the pen-name of "Ajawb," to Cellon dope. I am sure Mr. Wallace Barr does not claim or attribute to himself the discovery in England of cellulose acetate dope for aircraft purposes, but it must be admitted that he was one of the first to recognise its enormous possibilities and advantages for this purpose, and has most energetically assisted in its general use in this country.

(Signed) ALBERT L. MOND, D.Sc. (Geneva).

19, Southampton Buildings, Chancery Lane, W.C.2.

SIR,—We notice in your issue of the 27th ultimo a letter from the British Emailite Company, Limited, commenting upon the article you published on the 13th ultimo regarding our firm, and we wish to concur with the remarks made in this letter, for neither Cellon, Limited, nor Mr. Wallace Barr has ever made any claim to having discovered the use of cellulose acetate solutions for aeroplane dopes in this country.

We are entirely in agreement with Mr. Bayley's remarks regarding the difficulties experienced in the manufacture of dope at the present time.

CELLON, LIMITED.

(Signed) W. J. SHILCOCK, Assistant-Secretary.

**CONCERNING WIRE ROPES.**

The following letter and the reply thereto are of interest:—

Sir,—On reading the interesting article on Wire Rope, in your issue of January 9th, one is disposed to draw attention to the value of information that might be forthcoming from a comparison of the "brittleness," "elastic limit," and "tenacity" shown by the wire from which an aeroplane stay is manufactured, with the corresponding properties exhibited by the wire of the same stay after different periods of service, and consequent exposure to all the severe effects of the continuous and rapid vibration due to working conditions.

W. R. B.

**THE REPLY.**

"W. R. B." in his letter commenting upon my recent article epitomises a matter upon which the Institution of Mech. Engineers has deemed it worth while to appoint a Special Committee of Inquiry. The thing is really one for experiment and investigation, and it might interest "W. R. B." to know that the article itself was read by the Chairman of the Institute's Committee on Wire Ropes with considerable interest.

Offhand, I should like to assure "W. R. B." and others that whilst we must wait for the results of the Committee personal investigation is helpful and interesting.

As this is a purely practical question, upon which it would be quite improper to seriously advance theoretical arguments, I will not treat the matter as "W. R. B." really should have it.

The whole trend of my article indicates that if wire ropes were designed on the Range of Stress basis, instead of on the Maximum Stress, there is no reason why the rope should not withstand vibration indefinitely. By range of stress, I mean to imply the algebraic sum of max. to min. stress. For example: if max. stress be 10 tons per square inch (tensile), varying to 4 tons per square inch, the range of stress is 6 tons.

But if the min. stress had been 10 tons per square inch compression, then the range of stress would be 20 tons.

Wohler has shown that for any material there is a limiting range of stress below which the number of repetitions of stress can be definite, without causing fracture, but above which fracture invariably incurs. In this connection I should advise "W. R. B." to look up "Unwin's Testing of Materials," and the Report of the British Association of 1887, page 424.

Generally speaking, alternating stress of high carbon, or hard carbon steel, stands better than soft or mild steel.

The actual point, then, which "W. R. B." has in mind is a mixture of bending and torsion which varies throughout the length of the wire, from maximum at the fixed end, to minimum at the centre.

And, further, there is no direct compression on cable.

I fear I could extend the matter at issue, with pleasure to myself, but the limits of the Editor's patience are now bounded by his space.

JOSEPH WILSON.

**IN ENEMY EYES.**

The following comments on the S.E.5 are rendered by a neutral correspondent from an article by Lieut. E. Bothe in the German paper "Luftwaffen":—

S.E. stand for Scouting Experimental and the appearance indicates its origination from the same works as produced the B.E. and R.E. aeroplanes, the shape of the planes and their stagger, the peculiar body with the engine pushed much forward, the four-bladed propeller, and the tail construction render the S.E. deceptively similar to the B.E.

As in the case of almost all new British aeroplanes the top planes are mounted to a canopy centre-piece, carried by four inclined struts, while the lower planes are in continuation of small rudimentary pieces. All four planes are equipped with ailerons, which is, too, a general peculiarity of the new British aircraft, and of the B.E. and R.E. in particular.

The far backwards situated seat of the pilot is astonishing, especially compared with the de Havilland 5. The British Aircraft Trade appears to move from one exaggeration to the other.

Owing to this position of the seat the mounting of the fixed machine-gun is peculiar too, the latter being positioned to the left behind the engine and enclosed by its bonnet. A second movable gun is to be found on the top plane, resting on an iron band, lying in the flying direction on two wooden blocks, in which state it is operated as a fixed gun, firing above the propeller, as the earlier practice was in the Nieuport and Martinsyde fighting single-seaters.

But in new practice, to which high attention should be paid, there is a bar, combining the end of the iron band with the body, whereon the machine-gun can be moved and adjusted at pleasure, thus even vertical fire being possible and offering new range of attack.

The power plant is a stationary 200 h.p. Hispano-Suiza engine with a film radiator in front. The fuel tanks are positioned in front of the pilot. The exhaust tubes are led to exceptional length behind the seat of the pilot on both sides.

The reliability of the new gun device will undoubtedly decide a coming quantity employment or not of this aircraft.



Firth's  
Best Cast Steel  
Files.

Apply for Copy of the  
New Official Price List.

Thos. Firth & Sons L. Sheffield.

**VICKERS LIMITED.**

Contractors to the  
**WAR OFFICE AND ADMIRALTY.**

**Aviation Department, Imperial Court,  
Basil Street, Knightsbridge, S.W.8.**

Telephone No.—  
KENSINGTON 6810 (2 lines).



Telegraphic Address—  
VICKERFYTA, KNIGHTS, LONDON.



# ALUMINIUM CASTINGS

## OF EVERY DESCRIPTION.

We make a  
Speciality  
of  
Aeronautical  
and  
Automobile  
Work.

We are making many thousands of **Aluminium Die Castings** weekly under the celebrated **Cothias** process—in many cases **entirely eliminating** machining operations, and we hold the sole manufacturing rights in the British Empire for this process.

Chemical and Physical tests are made on our own premises, and our **Castings**, both **Sand** and **Die**, are produced under the most up-to-date and scientific methods.

Sole makers of the **Birmal Aluminium Pistons**, thousands of which are running to-day in a highly satisfactory manner under the most severe conditions.

Highest  
Class  
Castings to  
Government  
Specifications.  
Prompt  
Delivery.

**BIRMINGHAM ALUMINIUM CASTING (1903) CO., LD.**  
**Cambridge Street Works, BIRMINGHAM.**

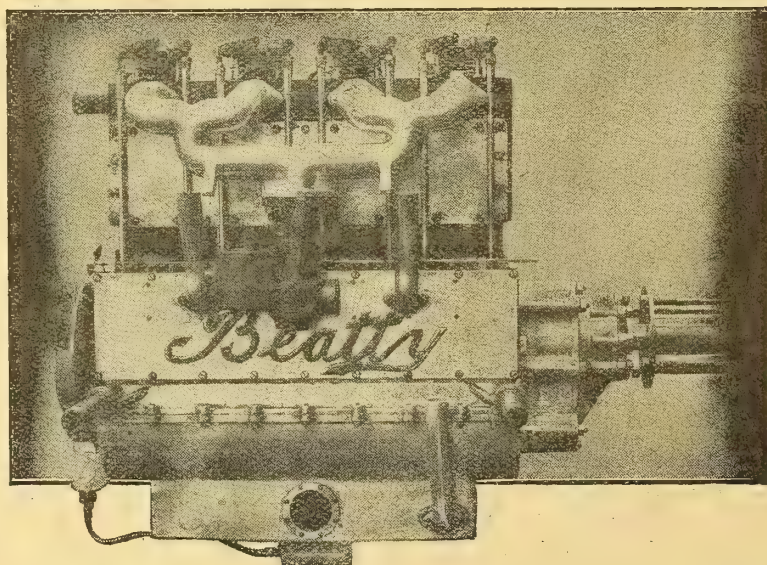
# The Beatty Monobloc Aero Engine

H.P. = 60.

R.P.M. = 1800  
Engine Shaft.

Prop. speed =  
1200 R.P.M.

Weight = 225 lbs



Petrol  
Consumption  
4.28 galls. per  
hour.


Oil  
Consumption  
.18 galls. per  
hour.

*Specially Designed and Developed for School Work.*

FULL  
PARTICULARS **The Beatty School of Flying Ltd.** LONDON  
AERODROME  
Telephone . . . Kingsbury 138.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





*Non-Flamm  
Celluloid*

Phone Central 1306 & 1307  
Telegrams "GREENBERG" LONDON

**GREENHILL & SONS**  
8 WATER-LANE LUDGATE-HILL  
LONDON. E.C. 4

Contractors to H.M. Admiralty, War Office and Foreign Governments.

# **The BRITISH CAUDRON**

CO., LTD.

SOLE BUILDING AND SELLING RIGHTS FOR

**Caudron Aeroplanes  
and Hydro-Aeroplanes**  
FOR  
**THE BRITISH EMPIRE AND DEPENDENCIES**

*Head Office and Works:*

**BROADWAY, CRICKLEWOOD, N.W. 2.**

Cable and Telegraphic Address: "CAUDROPLAN, CRICKLE, LONDON."

Phone: 4647  
4648 HAMPSTEAD

*Scottish Factory and Aerodrome:*

**ALLOA.**

Cable and Telegraphic Address: "CAUDROPLAN, ALLOA."

Phone: 52



The "Guardian



Angel" Parachutes

**THE CLASS OF OUR LIFE-SAVING EQUIPMENT.**

The basic characteristics of our Parachutes, which differentiate them from all others, and for which we hold master-patents, are automatic (i.e., compellative) opening, and static and kinetic control (i.e., control at rest and in action) of all their component details. The ordinary parachute is under no sort of control, and what we have accomplished is to convert this most insubordinate Apache of the Air into a staid servitor, incapable of acting in any other than the designed way. We have made the Parachute into an automatic machine, so that failure to open and entanglement of rigging has become a physical impossibility. Every Type of Parachute made by us possesses these paramount and indisputable principles of machine action. The aviator makes his jump, and the Parachute automatically does the rest.

**THE RANGE OF OUR LIFE-SAVING EQUIPMENT.**

Life-saving Parachutes for school machines on the Training-Grounds.

Life-saving Parachutes for heavy bombing machines, fighters, and scouts.

Life-saving Parachutes with minimum weight and without additional air resistance for the fastest machine that flies, and capable of release from any vertical or horizontal angle, or when flying upside down.

Solo-Parachutes for use from Airships and Observation Balloons, with a high but constant-speed initial drop from a fired gas-bag, automatically opening into the low-speed descent required for a safe landing.

Basket-Parachutes for instantly detaching the basket containing two observers, their instruments and records, from a fired gas-bag, with high-speed initial fall, changing automatically to slow-speed descent for the safe landing. Parachute instantly released on landing, to avoid dragging the basket.

Variable-speed Parachutes, to permit a sudden high-speed drop, controlled by the Parachutist, to escape from an enemy aeroplane, and to stop on any portion of the grade of descent to avoid an objectionable landing. This variable-speed apparatus is applicable to the whole range of our Parachutes.

Non-spinning shock-absorber slings, taking all shocks off Parachute and man.

Aviator's Harness, distributing the stresses over those parts of the body best able to sustain them, and instantly releasable when alighting on land, on a roof, in a tree, or in water.

**OUR EQUIPMENT IS THE RESULT OF ENGINEERING SCIENCE APPLIED TO DIFFICULT AIR PROBLEMS. WE BELIEVE THAT ITS EXTENDED USE WILL DOUBLE THE FLYING LIFE OF OUR FIGHTERS AT THE FRONT.**

**RELIABILITY—First.****RELIABILITY—Second.****RELIABILITY—ALL THE TIME.****E. R. CALTHROP'S AERIAL PATENTS, LTD.****ELDON STREET HOUSE, ELDON STREET, LONDON, E.C.2.**

Telephones (2 lines): London Wall 3266 and 3267.

Telegraphic and Cable Address: "Savemalivo-Ave-London."

THE

**GRAHAME-WHITE****AVIATION CO., LTD.**Early Delivery of **AVRO** Metal Parts.Immediate Delivery of **De. H.** Blankings and Axles Complete.**THE LONDON AERODROME, HENDON, N.W.9.**

Proprietors of the London Aerodrome

Telegrams:

**VOLPLANE, HYDE, LONDON.**

and

**The GRAHAME-WHITE School of Flying.**

Telephone:

Kingsbury 120 (5 lines).



**Contractors to the Admiralty and Air Board.**



**THE  
CENTRAL AIRCRAFT COMPANY**

**DESIGNERS AND CONSTRUCTORS  
OF AIRCRAFT.**

**Office and Works:**

**KILBURN, N.W.6.**

**Telegrams: Aviduction, Phone, London.**

**Telephone: Hampstead 4403, 4404.**

**HANDLEY PAGE  
LTD.**

**CONTRACTORS TO  
THE ADMIRALTY  
AND WAR OFFICE**

**CRICKLEWOOD,  
LONDON, N.W.2.**

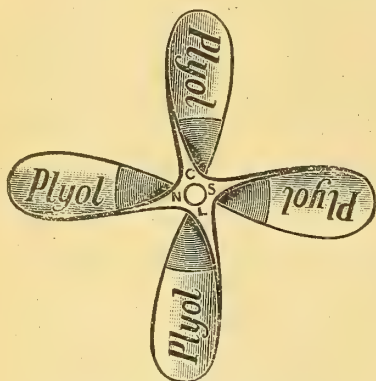
**HAMPSTEAD 7500 (9 lines).**

**"HYDROPHID, CRICKLE," LONDON**



**"PLYOL"**

THE  
BEST CEMENT  
FOR  
THREE-PLY,  
Veneering, etc.



Registered Trade Mark.

**ALDGATE CASEIN WORKS.****NIEUWHOF, SURIE & Co., Ltd.**

HEAD OFFICE

**5, Lloyds Avenue, London, E.C. 3.**

Works :

**ALDGATE AVENUE, ALDGATE, E.C.**

Also Caseln especially adapted for  
Waterproof Paints, Varnish, etc.

Telephones  
AVENUE 34, 35.

Telegrams:  
'SURIGODON, FEN LONDON.'

**A.G.S. Parts**

*Day and Night Production.  
The most Modern Plant in  
London.*

**THE MEERLOO  
ENGINEERING CO., LTD.**

*AERONAUTICAL ENGINEERS.*

**EASTERN WORKS, FOREST LANE  
STRATFORD :: LONDON, E.15.**

Managing Director:  
JOHN MEERLOO, Jun.

Telephone: STRATFORD 973.  
Telegrams: AEROMECOL,  
'PHONE, LONDON.



# CONTRACTORS TO THE ADMIRALTY.

Telegrams: "SUPERMARINE,"

'Phone: WOOLSTON 37.

ESTABLISHED 1912.

# The Supermarine

# Aviation Works Ltd

## Designers and constructors of Aircraft.

FLYING WATER & SLIPWAYS:  
**WOOLSTON**

H SCOTT-PAINE, GENERAL MANAGER



OFFICES & WORKS:  
**SOUTHAMPTON**  
ENGLAND.

Telephones: DALSTON 872.

LONDON WALL 9766.

HAMPSTEAD 4768.

# Thames Aviation Works

(BURTON'S, LTD.)

**TWO COMPLETE MILL PLANTS AND TWO YEARS' EXPERIENCE.**

Addresses of our fine Saw Mills, Works, etc.,  
— have been camouflaged by the Censor. —

Offices only: 141, CURTAIN ROAD, E.C.

## CONSTRUCTORS OF COMPLETE AIRCRAFT

And all kinds of WOOD PARTS, WINGS, AILERONS,  
— STRUTS, LEVERS, RUDDERS, NACELLES, &c. —

## Specialities—BIG STUFF and BEST WORK.





# The Aeroplane

## Acceptance and Experimental Flights—

The Prodigy Issue Aviation Co., "Aeromina, Piccy, London." Gerrard 278 (2 lines).

## Acetylene Welding Plant—

Acetylene Corporation of Great Britain, Ltd., The 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.  
Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3549 Victoria (3 lines).

## Aeroplane Manufacturers—

Aircraft Manufacturing Co., Ltd., Hendon. "Airmanship, Hyde, London." Kingsbury 180.

Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle-on-Tyne. "Armstrong Aviation, Newcastle-on-Tyne." Gosforth 500.  
Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.  
British & Colonial Aeroplane Co., Ltd. (The Bristol Co.), Filton, Bristol. "Aviation, Bristol." Bristol 3906.

British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudroplan, Crickle, London." Hampstead 5551.

Central Aircraft Co., Palmerston Works, High Road, Kilburn, N.W.6. "Aviduction, Phone, London." Hampstead 4493 and 4494.

Davidson Aviation Co., Ltd., Hammersmith, W.6. "Hammersmith 1992 (3 lines)."

Eastbourne Aviation Co., Ltd., Eastbourne. "Aircraft, Eastbourne." Eastbourne 1770.

Graham-White Aviation Co., Ltd., London Aerodrome, Hendon. "Volplane, Hyde, London." Kingsbury 120.

Handley Page, Ltd., 110, Cricklewood Lane, N.W.2. "Hydrophid, Crickle, London." Hampstead 7420.

Hooper & Co., Ltd., 54, St. James St. Piccadilly, London, S.W. "Sociable, St. James, London." Regent 612.

Mann, Egerton & Co., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Martinsyde, Ltd., Brooklands, Byfleet. "Martinsyde, Weybridge." Woking 331; Byfleet 171.

National Aircraft Co., Ltd., 15, Hackney Road, N.E.2. "London Wall 6725."

"Nieuport" & General Aircraft Co., Cricklewood, London, N.W.2. "Nieuscut, Crickle, London." Willesden 2455.

Norman-Thompson Flight Co., Ltd., Bognor. "Soaring, Bognor." Bognor 48.

The Regent Carriage Co., Ltd., 126/132, New King's Road, Fulham, S.W.6. "Carbodia, London." Putney 2240-2241.

Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester." City 8530-8531, Manchester.

Saunders, S. E., Ltd., East Cowes, I.O.W. "Consuta, East Cowes." Cowes 193.

Short Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tested, Phone, London." Regent 378.

Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston." Kingston 744.

Standard Aircraft Manufacturing Co., Eppingham House, Arundel Street, W.C.2. "Gunsgrush, Estrand, London." City 89.

Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickerlyta, Knights, London." Kensington 6870.

Waring & Gillow, Ltd., Hammersmith. "Warisen, Ox, London." Museum 5000.

Westland Aircraft Works, Yeovil. "Aircraft, Yeovil." Yeovil 120.

White, J. Samuel, & Co., Ltd., East Cowes. "White, East Cowes." Cowes 3.

Whitehead Aircraft (1917), Ltd., Richmond Surrey. "Whitcraft, Richmond, Surrey." Richmond 1865.

Wycombe Aircraft Constructors, Ltd., High Wycombe, Bucks. "Aircraft, High Wycombe." High Wycombe 84.

## Airships—

Airships, Ltd., High Street, Merton. Short Bros., Rochester, Eastchurch, and Whitehall House, S.W. "Tested, Phone, London." Regent 378.

## Aluminium Castings (Sand & Die)

Coan, R. W., 219, Goswell Road, London, E.C.1. "Krankases, Isling, London." City 2846.

## Bearings (Etonia Cast Phosphor Bronze)—

Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds." Central 3927.

## Brass Sheets for Tipping Propellers—

Pritt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fen, London." Avenue 995, 996, and 7006.

## Buildings—

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

Palmer, T. W., & Co., Church Road, Merton Abbey, Surrey. "Wimbledon 1313."

Rubery, Owen & Co., Darlaston, South Staffs. The Wilkey Co., Ltd., Salisbury House, London Wall, E.C.2. "Wrathless, Phone, London." City 2681-2.

## Cable Coverings and Cable Controls—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Capstan Work—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Carburettors—

Hobson, H. M., Ltd., 29, Vauxhall Bridge Road, S.W.1. "Victoria 4070."

## Casein—

Nieuwhof, Surie & Co., Ltd., 5, Lloyds Avenue, London, E.C.3. "Surico don, Fen, London." Avenue 34 and 35.

## Castings—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Castings (Aluminium, Brass, Bronze, Machined or Rough)—

Gabriel & Co., 4 and 5, A B Rows Birmingham. "Gabriel, Birmingham." Central 1223.

## Celluloid (Non-Flam.)—

Greenhill & Sons, 8, Water Lane, E.C. "Greenberg, London." Central 1309-7.  
London Label Co., Beckton Road, E.10. "London Label, Canning, London." East 1300.

## Clothing—

Burberry's, Ltd., Haymarket S.W.1. Regent 2165.  
Dunhill, Ltd., Euston Road, N.W.1. "Dunhill, London." North 3495-6.

## Component Parts—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (4 lines).

Central Aircraft Co., Palmerston Works, High Rd., Kilburn, N.W.6. Hampstead, 4728.

"Aviduction, Phone, London." P.D.V. Aircraft Co., Ltd., Princes Street, Richmond. "Aeros, Richmond." Richmond 1681.

The Aircraft Construction Co., Hurley Works, Beckton Road, E.16. "Aeracractions, Canning, London." East 1300.

Thompson Bros. (Bilston), Ltd., Bladley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

## Cords, Tapes, and Threads—

MacLennan, I., & Co., 39, Newgate Street, E.C.1. And at Glasgow. City 3115.

## Dopes—

British Aeroplane Varnish Co., Ltd., 166, Piccadilly, W.1. "Tetrafree, Piccy, London." Gerrard, 2312.

British Cellulose Co., 8, Waterloo Place, S.W.1. "Cellutite, London." Regent 4046.

The British Enamellite Co., Ltd., 30, Regent Street, S.W.1. "Ridley, Piccy, London." Gerrard 280.

Celloan, Ltd., Broad Street House, New Broad Street, E.C.2. "Ajawb, London." London Wall 5539-3622.

Clark, Robert, Ingham & Co., Ltd., House, Bedford Street, Strand, W.C. "Pearline, Westrand." Regent 3923.

## Engines and Parts—

Allen, W. H., Son & Co., Ltd., Queen's Engineering Works, Bedford. "Pump, Bedford." Bedford No. 1.

Arrol-Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

The Beatty School of Flying, Ltd., The Broadway, Cricklewood, N.W.2. Hampstead 3000.

Beardmore Aero Eng., Ltd., 112, Great Portland Street, W.1. "Beardmore, London." Gerrard 238.

Dudbridge Iron Works, Ltd. (Salinson), 87, Victoria Street, London S.W.1. "Aero-flight, Vic, London." Vic 7026.

Gordon Watney & Co., Ltd., Weybridge. "Mercedés, Weybridge." Weybridge 550 (7 lines).

Green Engine Co., Ltd., Twickenham. "Richmond 1203."

Gwynnes, Ltd., Hammersmith Iron Works, Hammersmith, W. "Gwynne, Hammersmith." Hammersmith 7010.

Napier & Son, D., Ltd., 14, New Burlington Street, London, W., and at Acton, W. "Nitriker, London." Gerrard 8926.

Robertson, J. H., & Co., 1, Albemarle Street, London, W.1. Regent 3096.

Rolls-Royce, Ltd., 14 and 15, Conduit St., W.1. "Rollhead, London." Gerrard 1654-5-6.

The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsaero, Phone, London." Regent 1181.

Sunbeam Motor Car Co., Ltd., Wolverhampton "Moorfield, Wolverhampton." Wolverhampton 983.

The Gnome & Le Rhône Engine Co., Ltd., 47, Victoria Street, S.W. "Elevenfold, London." Walthamstow 408 (2 lines).

## Electrical Accessories—

Belling & Co., Derby Road Works, Montague Road, Upper Edmonton, N.18. "Belling, Edmonton." Tottenham 1684.

Johnson & Phillips, Ltd., Charlton, London. S.E.7. "Juno, London." Central 2207, London Wall 1564.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Eus road, London." Museum 70.

Premier Electric Heaters, Ltd., 258, 259, and 360, Bradford Street, Birmingham. "Fahrenheit, Birmingham." Midland 081.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

## Electric Cables—

E. Kalker & Co., Coventry. "Kalker, Coventry." Coventry 24X.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207, London Wall 1564.

## Electric Lighting and Power—

L. Stanley Fardon, A.M.I.E.E., 67, Mosley Street, Manchester.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "Juno, London." Central 2207, London Wall 1564.

## Electro Platers and Metal Polishers' Engineers—

W. Canning & Co., 135-137, Great Hampton Street, Birmingham. "Materials, Birmingham." Birmingham 3622 Central (3 lines).

## Flare Lights—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3549 Victoria (3 lines).

## Flexible Shafts—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Flying Schools—

Bournemouth Aviation Co., Ltd., Talbot Village, Bournemouth. "Etches, Winton." Bournemouth 1160.

Cambridge School of Flying and Aerodrome Co., 308, St. Andrews St., Cambridge. "Carbon, Cambridge." Cambridge 5 and 1086.

## Furniture (Office)—

Cooke's (Finsbury), Ltd., Finsbury, Pavement House, London, E.C.2. London Wall 573 and 6179.

## Galvanising—

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

The Rustless Iron (Copper Coles Process), Ltd., 1, French St., Sunbury-on-Thames, Middlesex. Sunbury 37.

## Gears—

Moss Gear Co., Ltd., Thomas Street, Aston, Birmingham. "Mosgear, Birmingham." East 407.

## Glue—

Central Chemicals, Ltd., 283, West End Lane, London, N.W.6. "Estrantral, Westhamp, London." Central 1203.

Improved Liquid Glues Co., Ltd., Gt. Hermitage Street, E. (Croid). "Excroiden Wapp, London." Avenue 3178.

Mendine Co., 8, Arthur Street, E.C. Bank 5873.

Oldroyd, Wm., & Sons, Ltd., 9, Mincing Lane, E.C.3.

## Goggles—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy London." Regent 1340.

## Gauges—

J. A. Prestwich & Co., Northumberland Park, Tottenham, N.17.

## Heating and Ventilating—

Chas. P. Kinnell & Co., Ltd., 65 & 65a Southwark Street, London, S.E.1. "Kinnell, London." Hop 372 (2 lines).

## Hollow Spars—

McGrue Bentwood Hollow Spar Co., Commercial Wharf, Lambeth, S.E. "Gabriel son, Watloo, London." Hop 718.

Robert Young's Construction Co., Ltd., Canonbury Works, Canonbury Street, Essex Rd., London, N.1.

## Instruments—

British Wright Co., Ltd., 33, Chancery Lane, W.C.2. "Holborn 1908."

## Instruments (Scientific, Altimeters, etc.)—

The Cambridge Scientific Instrument Co., Ltd., Cambridge. "Instrument, Cambridge." Cambridge 642.

Short & Mason, Ltd., Macdonald Road, Walthamstow, E.17. "Aneroid, Phone, London." Walthamstow 180.



# Buyers' Guide.



## Machine Tools—

Brewster & Co., 11, Queen Victoria Street, E.C.4. "Circumfuse. Cannon. London." City 768

## Magneto Driving Pieces—

Herbert Terry & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61

## Magnetos—

British Thomson-Houston Co., Ltd., Lower Ford Street, Coventry. "Asteroidal, Coventry." Coventry 278.

The M.L. Magneto Syndicate, Ltd., Victoria Works, Coventry. "Cortlon, Coventry." Coventry 1008-1009.

The British Lighting & Ignition Co., Ltd., 201, Tottenham Court Road, W.1. "Vicks mag. Phone, London." Museum 430

Eriasson Manufacturing Co. (Berling Magneto), Buffalo, N.Y., U.S.A.

## Metal Manufacturers—

Clifford, Chas., & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 42-43.

## Metals in General—

Guthrie, J. B., & Son, 30, St. Mary Ave, E.C.3. Pritt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fen, London." Avenue 085, 086, and 7006

Samuel Mercer & Co., 108, Upper Thames Street, E.C.4. "Reconciled, Cannon. London." City 6342.

## Metal Parts and Fittings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

Aircraft Supplies Co., Ltd., Ascot, London, W.1. "Long Acre, W.C.2." Upcast, Rand, London. Gerrard 270 (2 lines).

Arnott & Harrison, Ltd., Hythe Road, Willesden Junction. Willesden 2267.

Bayliss, Jones & Bayliss, Ltd., Wolverhampton. (Bolts and Nuts.) "Bayliss, Wolverhampton." Wolverhampton 1041.

The Birmingham Guild, Ltd., 45, St. Charles Street, Birmingham. "Handicraft." Central 3705.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

British Metal (Kingston), Ltd., Kingston-on-Thames. "Propellers, Kingston." Kingston 111 (3 lines).

Guthrie, J. B., & Son, 30, St. Mary Ave, E.C.3. Avenue 1432.

Lombard Rim and Tube Co., Lombard Street, Birmingham. "Lombard, Birmingham." Midland 211 (2 lines).

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Installing, Euston, London." Museum 70.

Mountford, Fredk., Ltd., Freno Works, Lifford, Birmingham. "Fremo, Birmingham." Kings Norton 261.

Robertson, J. H., & Co., 1, Albemarle Street, London, W.1. Regent 3906.

Rubery, Owen & Co., Darlaston South Staffs. Sankey, Joseph & Sons, Ltd., Wellington, Shropshire. "Sankey, Wellington, Salop." Wellington 66.

The Pulvo Engineering Co., Ltd., 10 to 16, Dane Street, High Holborn, London, W.C.1. "Pulvulp, Phone, London." Holborn 470.

The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsdon, Phone, London." Regent 1181.

The Aircraft Construction Co., Harley Works, Beekton Road, E.16. "Aeracracons, Canning, London." East 1300.

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

Thompson Bros., Ltd., Braxley, Bilston. "Thompson Bros, Bilston." Bilston 10.

Wooler Engineering Co., Ltd., Old Oak Common Lane, Willesden Junction, N.W.10.

## Metal Shearing Tools—

Montgomery, Smith, & Co., Ltd., Tangent Works, Keynham, near Bristol. "Ingenuity, Saltford." Keynham 21.

## Metal Spinnings—

Arnold & Sons, Standard Works, Lawrence Road, Tottenham, N.15. "Instruments, London." Tottenham 2370-1.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Metric Bolts—

Cashmore Bros., Zota Works, Hildreth Street, Balham, S.W. Bettersea 415.

Rubery Owen & Co., Darlaston, South Staffs.

## Miscellaneous—

Anderson, D., & Son, Ltd (Roofs), Belfast. "Anderson, Belfast." Belfast 4033-4034-4035.

Bowden Wire, Ltd., Willesden Junction, "Bowirelim, Harles, London." Willesden 2400 (3 lines).

British Metal (Kingston), Ltd., Kingston-on-Thames. "British Metal, Bethrood, London." London Wall 6100.

Herbert Flood Co., Ltd., Chapel-en-le-Frith. "Frodobake, Birmingham." Central 793.

London Label Co., Ltd., Harley Works, Beekton Road, E.16. "Nonflamoid" Nonflammable Celluloid. "Lonlabel, Canning, London." East 1300.

MacLennan, J., & Co., 30, Newgate Street, E.C.1. and at Glasgow. Tapes, Cords and Threads. City 3115.

## Motor Cars—

Arrol Johnston, Ltd., Dumfries. "Mocar, Dumfries." Dumfries 281-282.

Mann, Egerton & Co., Ltd., 370/381, Euston Road, London, N.W.1. "Manegecar, Euston, London." Museum 70.

Standard Motor Car Co., Coventry. "Flywheel, Coventry." Coventry 530 (4 lines).

## Nameplates and Labels—

British Metal (Kingston), Ltd., Kingston-on-Thames. "British Metal, Kingston." Kingston 111 (3 lines).

The Clegg Metal Engraving Co., Chatsworth Works, Worthing. "Clegg Worthing." Worthing 111 (3 lines).

## Observation Panels—

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterly, Piccy, London." Regent 1340.

## Parachutes—

E. K. Callitrop's Aerial Patents, Ltd., Eldon Street House, Eldon Street, London, E.C. "Savemativo, Ave, London." London Wall 3266-3267.

## Pattern Making—

Fiedk. Ward, 6, 7 and 8, Allsop Street, Upper Baker Street, W. Padd 4743.

## Piston Rings—

British Chuck & Piston Ring Co., Coventry. "Rings, Coventry." Coventry 723.

## Plating, Nickel Silver and Electro Tinning—

Arnold & Sons, Standard Works, Lawrence Road, Tottenham, N.15. "Instruments, London." Tottenham 2370-1.

## Power Presses and Dies—

Bliss, E. W., & Co., 20, Pocock Street, Blackfriars Road, London, S.E.1. "Blissdon, London." Hop 4340.

## Presswork—

Rubery Owen & Co., Darlaston, South Staffs. Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

## Propellers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

Ebora Propeller Co., 11 & 12, Surbiton Park Terrace, Kingston-on-Thames. "Ebora, Kingston." Kingston 672.

Integral Propeller Co., Ltd. "Avirop, Hyde, London." Hendon 4. Kingsbury 104.

Lang Propeller, Ltd., Weybridge. "Aerostatics, Weybridge." Weybridge 520-521.

Mann, Egerton & Co., Ltd., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

Oddy, W. D., & Co., Leeds. "Aircsrews, Leeds." Central 291, Leeds.

Stanley Aviation Co., 67, Kingsland Road, E.2. City 8347.

Westland Aircraft Works, Yeovil. "Aircraft, Yeovil." Yeovil 129.

## Pyrometers—

The Foster Instrument Co., Letchworth, Herts. Foster Instruments, Letchworth, Letchworth 26.

## Rigging for Aircraft—

Craddock, Geo., & Co., Ltd., Wakefield, England. "Craddock, Wakefield." Wakefield 460.

## Rubber Tubing & Accessories—

Hancock, James Lyne, Ltd., 260, Goswell Road, London, E.C.1. "Masticator, Isling, London." City 3811 and 3812.

## Safety Belts—

Holmes, C. H., & Son, 38, Albert Street, Manchester. "Semloh, Manchester." City 4432.

## Screw-driving Machines—

Russell Bros. (Redditch), Ltd., Littleworth, Redditch. "Inventors, Redditch." Redditch 74.

## Seaplane Manufacturers—

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (3 lines).

Gosport Aircraft Co., Gosport. "Flight, Gosport." Telephone No. 217.

Mann, Egerton & Co., Ltd., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (4 lines).

The Norman Thompson Flight Co., Ltd., Middleton, Bognor. "Soaring, Bognor." Bognor 48.

Short Bros., Rochester. "Seaplanes, Rochester." Chatham 627.

Supermarine Aviation Co., Ltd., Southampton. "Supermarine, Southampton." Southampton 1337.

## Searchlights and Landing Lights—

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibruc, Phone, London." 3340 Victoria (3 lines).

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

## Seats for Aeroplanes—

Bowser, E., Art Cane Works, 50 Park Lane, Leeds. Central 3473.

## Shackles—

The Rotax Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rodynalite, Phone, London." Willesden 2480.

## Sheet Metal Pressings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

Arnold & Sons, Standard Works, Lawrence Road, Tottenham, N.15. "Instruments, London." Tottenham 2370-1.

Blackburn Aeroplane and Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345.

W. H. Briscoe & Co., Ltd., 51 and 52, Park Street, Birmingham. "Brisk, Bham." Central 530.

British Metal (Kingston), Ltd., Kingston-on-Thames. "British Metal, Kingston." Kingston 111 (3 lines).

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

London Aluminium Co., Ltd., Westwood Road, Aston, Birmingham. East 497 Birmingham.

Rubery Owen & Co., Darlaston, South Staffs.

## Sheet Metal Work—

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4800.

Arnold & Sons, Standard Works, Lawrence Road, Tottenham, N.15. "Instruments, London." Tottenham 2370-1.

British Metal (Kingston), Ltd., Kingston-on-Thames. "British Metal, Kingston." Kingston 111 (3 lines).

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Rubery Owen & Co., Darlaston, South Staffs. The Acetylene Corporation of Great Britain, Ltd., 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4800.

The Selsdon Aero & Engineering Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Selsdon, Phone, London." Regent 1181.

Arthur Hill & Co., Silchester Road, North Kensington, W. Park 1443.

## Shock Absorbers (Elastic Cord)—

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

## Sparking Plugs—

Lodge Sparking Plug Co., Ltd., Rugby. "Igniter, Rugby." Rugby 235.

Ripault, Leo, & Co., Ltd. (Oleo Plugs), 644, Poland Street, W.1. "Ripault, Reg, London." Gerrard 7758.

## Springs—

Dart Spring Co., West Bromwich. "Dart, West Bromwich." West Bromwich 322.

Gabriel & Co., 4 and 5, A B Row, Birmingham. "Gabriel, Birmingham." Central 1223.

Terry, Herbert, & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61 (3 lines).

## Stampings—

Guthrie, J. B., & Son, 30, St. Mary Ave, E.C.3. Arnold & Sons, Standard Works, Lawrence Road, Tottenham, N.15. "Instruments, London." Tottenham 2370-1.

## Steel—

Firth, Thos., & Sons, Sheffield. "Firth, Sheffield." Sheffield 3230 to 3237.

Guthrie, J. B., & Son, 30, St. Mary Ave, E.C.3. Avenue 1432.

Nicklin, Bernard, & Co., Birmingham. "Bernico, Birmingham." Smithwick 224.

## Steel Stamps and Markings—

John Meerloo & Sons, Cleveland Works, Cleveland Street, Mile End, E.1. "Daylur, Phone, London." East 3331 (2 lines).

## Steel Tubes for Aeroplanes—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (3 lines).

## Taper Pins—

Mountford, Fredk. (Birmingham), Ltd., Freno Works, Lifford, Birmingham. "Fremo, Birmingham." King's Norton 261-262.

## Tapes and Smallwares—

MacLennan, John, & Co., 30, Newgate Street, E.C.1. and at Glasgow. City 3115.

James North Hardy & Son, Ltd., 54, Portland Street, Manchester. "Hardson, Manchester." Central 6471.

## Timber—

Engineering Timber Co., Ltd., 9, Victoria Street, London, S.W. "Entikos, Vic, London." Victoria 5073, 4210.

Brown, R. F., & F. W., Wollaton Saw Mills, near Nottingham. "Brown's Saw Mills, Wollaton." Nottingham 1526.

J. Owen & Sons, Ltd., 100a, Borough High Street, S.E.1. "Bucheron, London." Hop 3811 (2 lines).

## BUYERS' GUIDE cont. on next page.









# The Aeroplane

# Buyers' Guide



## Acceptance and Experimental Flights—

The Proctor, Ltd., Aviation Co., "Termonia," Poles, London. Central 278 (13 lines).

## Acetylene Welding Plant—

Acetylene Corporation of Great Britain, Ltd., The 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4890. Imperial Light, Ltd., 125 Victoria Street, London, S.W.1. "Lithia, Vic, London." Vic 4890.

## Aeroplane Manufacturers—

Aircraft Manufacturing Co., Ltd., Hendon "Airmanship, Hyde, London." Central 1484.

Armstrong, Sir W., Whitworth & Co., Ltd., Newcastle-on-Tyne. "Armstrong, Victoria, Newcastle-on-Tyne." Gosforth 309.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (13 lines).

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

British & Colonial Aeroplane Co., Ltd., The Bristol Co., Filion, Bristol. "Aviation, Bristol." Bristol 600.

British Caudron Co., Ltd., Broadway, Cricklewood, N.W.2. "Caudron, Cricklewood, London." N.W.2. Central 1223.

Central Aircraft Co., Plimsdon Works, High Road, Kilmoryn, N.W.6. "Aviation, Plimsdon, Plimsdon, London." Central 1223.

Davidson Aviation Co., Ltd., Hampstead, W.6. "Aviation, Hampstead, Hampstead, W.6." Hampstead 1223.

Easton & Parnall, Ltd., "Aviation, Easton, Easton, London." Central 1223.

Graham White Aviation Co., Ltd., London. "Aviation, Graham, Graham, London." Central 1223.

Handley Page, Ltd., 100, Cricklewood Lane, N.W.2. "Hydrofoil, Cricklewood, London." Hampstead 7420.

Hooper & Co., Ltd., 51, St. James St., Piccadilly, London, S.W. "Sociable, St. James, London." Regent 012.

Mann, Egerton & Co., Aircraft Works, Norwich. "Motors, Norwich." Norwich 482 (14 lines).

Martinsyde, Ltd., Brooklands, Bletchley, "Martinsyde, Weybridge." Weybridge 67.

National Aircraft Co., Ltd., 51, Hackney Road, N.E.2. "Nieuport & General Aircraft Co., Cricklewood, London, N.W.2. "Nieuport, Cricklewood, London." Widdowson 2455.

Norman-Thompson Flight Co., Ltd., Bognor. "Searing, Bognor." Bognor 48.

The Regent Carriage Co., Ltd., 125/127, New King's Road, Fulham, S.W.6. "Corbairis, London." Putney 2240-2241.

Roe, A. V., & Co., Ltd., Manchester. "Triplane, Manchester." City 830-833.

Saunders, S. E., Ltd., East Cotes, I.O.W. "Convalta, East Cotes." Cotes 109.

Short, Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tested, Phone, London." Regent 328.

Sopwith Aviation Co., Ltd., Kingston-on-Thames. "Sopwith, Kingston." Kingston 744.

Standard Aircraft Manufacturing Co., Ltd., Ham House, Arundel Street, W.C.2. "Gunsingh, Eastchurch, London." City 89.

Vickers, Ltd., Imperial Court, Basil Street, Knightsbridge, S.W.3. "Vickers, Knightsbridge, London." Kensington 680.

Waring & Gillow, Ltd., Ham House, Weymouth, Dorset. "Weymouth, Weymouth, Dorset." Weymouth 1000.

Westland Aircraft Works, Yeovil. "Aircraft, Yeovil." Yeovil 100.

White, J. Samuel & Co., Ltd., East Cotes. "White, East Cotes." Cotes 3.

Whitehead Aircraft (1917), Ltd., Richmond Surrey. "Whitehead, Richmond." Richmond 1861.

Wycombe Aircraft Constructors, Ltd., High Wycombe, Bucks. "Aircraft, High Wycombe." High Wycombe 84.

## Airships—

Airships, Ltd., High Street, Merioneth, Shropshire. "Airships, Merioneth, Merioneth, Shropshire." Merioneth 1314.

Shed, Bros., Rochester, Eastchurch and Whitehall House, S.W. "Tested, Phone, London." Regent 328.

## Aluminium Castings (Sand & Die)

Coan, R. W., 219, Goswell Road, London, E.C.1. "Krankhaus, Isling, London." City 846.

## Bearings (Ironia Cast Phosphor Bronze)—

Yorkshire Engineering Supplies, Ltd., Wortley, Leeds. "Yes, Leeds." Central 397.

## Brass Sheets for Tipping Propellers—

Pitt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fens, London." Avenue 095, 096, and 706.

## Buildings—

Boulton & Paul, Ltd., Rose Lane Works, Norwich. "Aviation, Norwich." Norwich 851.

Falmer, T. W., & Co., Church Road, Merioneth, Shropshire. "Merioneth, Merioneth, Shropshire." Merioneth 1314.

Rubery Owen & Co., Darlington, South Staffs. "The Willey Co., Ltd., Salisbury House, London Wall, E.C.2. "Wardles, Phone, London." City 2682.

Johnston & Phillips, Ltd., Chertsey, London S.E.7. "John, London." Central 2207.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Lastling, London, London." Museum 79.

Premier Electric Heaters, Ltd., 258, 259, and 300, Bradford Street, Birmingham. "Electric, Birmingham." Midland 681.

The Rutas Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rutas, Phone, London." Willesden 280.

E. Kalkor & Co., Coventry. "Kalkor, Coventry." Coventry 428.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Sunbeam Motor Car Co., Ltd., Wolverhampton. "Sunbeam, Wolverhampton." Wolverhampton 684.

The Engine & Le Rhone Engine Co., Ltd., 25, Victoria Street, S.W. "Le Rhone, London." London 1223.

Walthamstow 458 (12 lines).

## Electrical Accessories—

Belling & Co., Derby Road Works, Manbridge Road, Upper Lichfield, N.18. "Belling, Edmonson." Lichfield 1884.

Johnston & Phillips, Ltd., Chertsey, London S.E.7. "John, London." Central 2207.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Lastling, London, London." Museum 79.

Premier Electric Heaters, Ltd., 258, 259, and 300, Bradford Street, Birmingham. "Electric, Birmingham." Midland 681.

The Rutas Motor Accessories Co., Ltd., Victoria Road, Willesden Junction, N.W.10. "Rutas, Phone, London." Willesden 280.

E. Kalkor & Co., Coventry. "Kalkor, Coventry." Coventry 428.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Cables—

E. Kalkor & Co., Coventry. "Kalkor, Coventry." Coventry 428.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

Johnson & Phillips, Ltd., Charlton, London, S.E.7. "John, London." Central 2207.

Electric Lighting and Power—

I. Stanley, Easton, A.M.E.E., 67, Mosley Street, Manchester. "Electric, Easton, Easton, London." Central 1223.

## Machine Tools—

Brewster & Co., 11, Queen Victoria Street, E.C.4. "Circumline, Cannon, London." City 708.

## Magneto Driving Pieces—

Herbert Terry & Sons, Ltd., Redditch. "Magneto, Redditch." Redditch 61.

## Magnetics—

British Thomson-Houston Co., Ltd., Lower Portland Street, Coventry. "Asteroid, Coventry." Coventry 278.

The M.I. Magneto Syndicate, Ltd., Victoria Works, Coventry. "Corticon, Coventry." Coventry 1008-1009.

The British Lighting & Ignition Co., Ltd., 203, Tottenham Court Road, W.1. "Vicks, London." Museum 429.

Ericsson Manufacturing Co. (Belling Magneto), Buffalo, N.Y., U.S.A.

## Metal Manufacturers—

Clifford, Chas. & Sons, Ltd., Birmingham. "Clifford, Birmingham." Central 4243.

## Metals in General—

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. "Pitt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fens, London." Avenue 095, 096, and 706.

Samuel Mercer & Co., 108, Upper Thames Street, E.C.4. "Reconciled, Cannon, London." City 6342.

## Metal Parts and Fittings—

Accles & Pollock, Ltd., Oldbury, Birmingham. "Accles, Oldbury." Oldbury 111 (13 lines).

Aircraft Supplies Co., Ltd., Aerial House, 125, Long Acre, W.C.2. "Unceat, Rand, London." Gerrard 270 (12 lines).

Arnott & Harrison, Ltd., Hyde Road, Willesden Junction, W.10. "Wilkes, London." Willesden 2207.

Bayless, James & Bayless, Ltd., Wolverhampton. (Bells and Nuts.) "Bayless, Wolverhampton." Wolverhampton 1941.

The Birmingham Guild, Ltd., 45, Gt. Charles Street, Birmingham. "Handicraft." Central 7705.

Blackburn Aeroplane & Motor Co., Ltd., Olympia, Leeds. "Propellers, Leeds." Roundhay 345 (13 lines).

British Metal (Kingston), Ltd., Kingston-on-Thames. "King, Kingston." Kingston 725.

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. "Pitt & Co., 46, Fenchurch Street, London, E.C.3. "Poetry, Fens, London." Avenue 095, 096, and 706.

Longbird Rim and Tube Co., Lombard Street, Birmingham. "Longbird, Birmingham." Central 4243.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Lastling, London, London." Museum 79.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Lastling, London, London." Museum 79.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Lastling, London, London." Museum 79.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Lastling, London, London." Museum 79.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Lastling, London, London." Museum 79.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Lastling, London, London." Museum 79.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Lastling, London, London." Museum 79.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Lastling, London, London." Museum 79.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Lastling, London, London." Museum 79.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Lastling, London, London." Museum 79.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Lastling, London, London." Museum 79.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Lastling, London, London." Museum 79.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Lastling, London, London." Museum 79.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Lastling, London, London." Museum 79.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Lastling, London, London." Museum 79.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Lastling, London, London." Museum 79.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Lastling, London, London." Museum 79.

Mann, Egerton & Co., Ltd., 177, Cleveland Street, London, W.1. "Lastling, London, London." Museum 7



**"The Aeroplane" Buyers' Guide.—continued.****Time Recorders—**

Gledhill-Brook Time Recorders, Ltd., 26, Victoria Street, S.W.1.  
Victoria 1310.

**Turnbuckles—**

Rubery Owen & Co., Darlaston, South Staffs.

**Tyres and Wheels—**

The Palmer Tyre, Ltd., Shaftesbury Avenue.  
"Tyricord, Westcent." Gerrard 1214 (5 lines)

**Undercarriages—**

Thompson Bros. (Bilston), Ltd., Bradley, Bilston, England. "Thompson Bros., Bilston." Bilston 10.

**Varnishes—**

The British Emailite Co., Ltd., 30, Regent Street, S.W.1. "Ridleyphen, Piccy, London." Gerrard 280.

Clark, R. Ingham & Co., Walter House, Bedford Street, Strand, W.C. "Pearline, Westrand." Regent 3023.

Harland, W., & Son, Merton, London, S.W.19. "Harland, Wimbledon 45." Wimbledon 45 and 1395.

Naylor Bros., Ltd., Southall, Middlesex. "Naylor, Southall." Southall 30.

**Washers—**

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3.  
Herbert Terry & Sons, Ltd. Redditch.  
"Springs, Redditch." Redditch 61.

**Vices—**

C. and J. Hampton, Ltd., Sheffield. "Vices, Sheffield." Attercliffe 95.

**Watchmakers and Jewellers**

(Silver Models)—  
Goldsmiths' & Silversmiths' Co., Ltd., 112, Regent Street, W.1. Gerrard 9001 (3 lines).

**Welding and Cutting Plant—**

Acetylene Corporation of Great Britain, Ltd., The, 49, Victoria Street, Westminster, S.W.1. "Flamma, Vic, London." Vic 4830.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

**Welding Repairs—**

Arnold & Sons, Standard Works, Lawrence Road, Tottenham, N.15. "Instruments, London." Tottenham 2370-1.

Barimar, Ltd., 10, Poland Street, W.1. "Bariquamar, Reg, London." Gerrard 8173.

The New Welding Co., 26, Rosebery Avenue, London, E.C.1. "Windoneeda, Holb, London." Holborn 5252.

Imperial Light, Ltd., 123, Victoria Street, London, S.W.1. "Edibrac, Phone, London." 3540 Victoria (3 lines).

**Wind Shields—**

Auster, Ltd., 133, Long Acre, W.C. "Win-Bector, London." Regent 5910.

Triplex Safety Glass Co., Ltd., 1, Albemarle Street, Piccadilly, W.1. "Shatterlys, Piccy, London." Regent 1340.

London Label Co., Ltd., Hadley Works, Beckton Road, E.16. "Nonflamoid" Nonflammable Celluloid. "Lonlabel, Canning, London." East 1300.

**Wire Gauze—**

N. Greening & Sons, Ltd., 16, Finsbury St., London, E.C.2. "Setscrew, Finsquars, London." London Wall 1082.

Guthrie, J. B., & Son, 30, St. Mary Axe, E.C.3. Avenue 1432.

**Wires and Cables (Aeroplanes)—**

Bruntons, Musselburgh, Scotland. "Wiremill, Musselburgh." Musselburgh 28.

Cradock, Geo., & Co., Ltd., Wakefield, England. "Cradock, Wakefield." Wakefield 466 (3 lines).

**Wirework—**

Terry Herbert & Sons, Ltd., Redditch. "Springs, Redditch." Redditch 61.

**Wood Refuse Suction Gas****Producers—**

Ruston Proctor & Co., Ltd., Lincoln, England. "Ruston, Lincoln." Lincoln 580.

**Woodworking Machinery—**

Robinson, Thomas, & Son, Ltd., Railway Works, Rochdale. "Robinson, Rochdale." Rochdale 467.

Sagar, J., & Co., Ltd., Halifax. "Sawtooth, Halifax." Halifax 136.

Wadkin & Co., Leicester. "Woodworker, Leicester." Leicester 3614.

By Royal Warrant  
of Appointment.



ESTABLISHED  
1819.

# ARNOLD & SONS,

## Engineers and Instrument Manufacturers,

Sheet Metal Work, Sheet Metal Pressing, Stamping, Spinning, Acetylene Welding,  
Nickel Plating, Silver Plating, Electro Tinning, etc., etc.

STANDARD WORKS, LAWRENCE ROAD, TOTTENHAM, N.15.

Head Office: GILTSPUR STREET, E.C.1.

Telegraphic Address:—"INSTRUMENTS," LONDON.

Telephone Nos.:—City Office: 5240, 5241, 5242 City. Factory: 2370 & 2371 Tottenham.

# SAGE

## AIRCRAFT SUPREMACY

has only been gained by efficient workmanship such as characterises the machines delivered to the Admiralty.

Sage Aircraft is perfect in every detail.

For information apply to—

E. C. GORDON ENGLAND, A.F.Ae.S.

**Fredk. SAGE**  
& CO. LTD.

**PETERBOROUGH**  
Head Office:  
58-62 GRAY'S INN RD., LONDON, W.C.



KINDLY MENTION "THE AEROPLANE"

WHEN CORRESPONDING WITH ADVERTISERS.



# WARING & GILLOW

*Furnishers & Decorators to H.M. the King* LTD

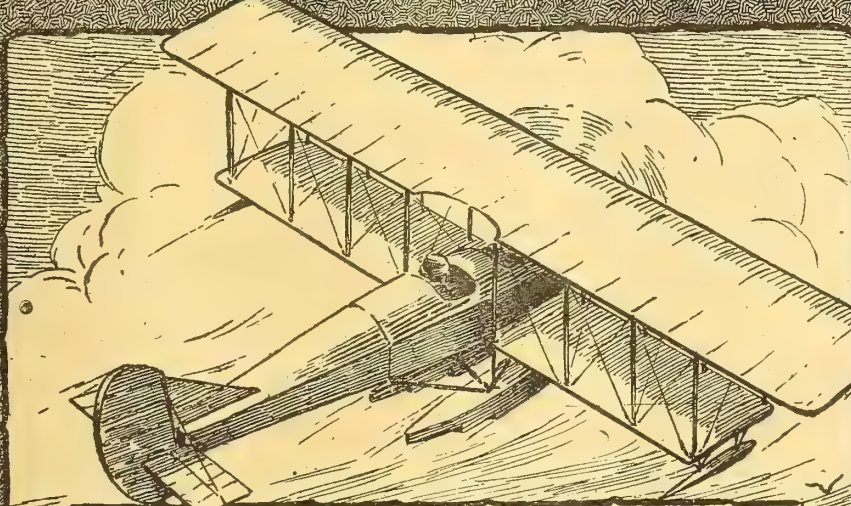
CONTRACTORS  
TO THE  
WAR OFFICE AND ADMIRALTY.  
LIVERPOOL      HAMMERSMITH      LANCASTER




TELEPHONE No.:  
HAMMERSMITH 1980

HEAD OFFICE  
OXFORD ST. W.1

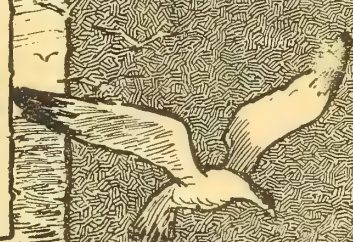
TELEGRAMS:  
"Warings Factories, Hammersmith."



## The WIGHT SEAPLANE



**J. SAMUEL WHITE & CO., LTD.**  
EAST COWES, I.W.  
BUILDERS OF  
"WIGHT" Type Aircraft, Fast  
Torpedo Vessels, etc., etc., etc.  
Telephone: No. 3 Cowes.      Telegrams: White, East Cowes.







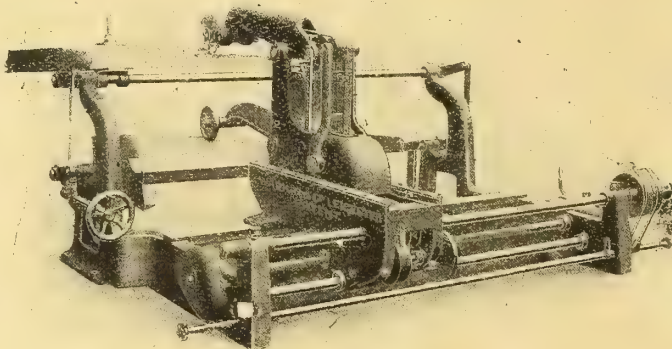
# AUTOMATIC PROPELLER SHAPERS.

For Propellers having any number of blades.

Our latest machines have 2 speeds of traverse along the blade, viz.:  $\frac{1}{4}$  in. and  $5\frac{1}{2}$  in. per minute.

An average size propeller can be shaped therefore in 30 mins.

Over 100 of these machines now in commission.



Made in 2 sizes to take propellers up to 12ft. and 14ft. dia.

Either machine deals with propellers 16in. wide and 9 $\frac{1}{2}$  in. deep through hub.

## PRICES.

12ft. type.. **£282 10s.**  
14ft. „ **£309 10s.**

An important feature is that WOODEN FORMERS ONLY are required. These can be easily made in your own shop and make the manufacture of small quantities of propellers a paying proposition on our machine.

## WADKIN & CO., LEICESTER.

Telegrams: "Woodworker."

'Phone Nos. 6614 and 5.

# NIEUPOORT

AND

## GENERAL AIRCRAFT COMPANY, L<sup>TD</sup>.

CONTRACTORS TO H.M. GOVERNMENT.

OFFICE AND WORKS—

**LANGTON ROAD,  
CRICKLEWOOD, LONDON, N.W.2**

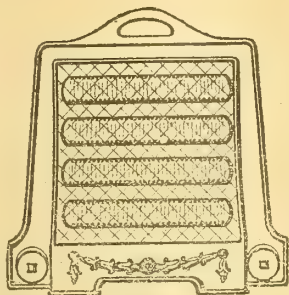
TELEPHONE (3 LINES)—  
WILLESSEN 2455

TELEGRAMS—  
NIEUSCCUT, CRICKLE, LONDON



# BELLING ELECTRICAL ACCESSORIES

## AIRCRAFT Manufacturing Purposes.



### ELECTRIC FIRE.

OFFICE PATTERN. List No. 617.  
An ideal fire for small offices, waiting rooms, passages, etc. We have also supplied a large number to Aerodromes for general heating. Numerous other designs are available.

PRICE 35/-

Dimensions—Height 17½ in.,  
Width 17½ in., Depth 5½ in.



### ELECTRIC

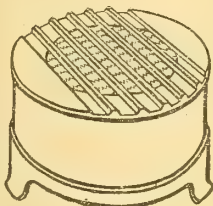
### AIR WARMER.

List No. 960.

A reliable low temperature heating appliance, suitable for work rooms, etc. Can be used in any position without risk of fire.

PRICE 25/-

Dimensions—Length 15½ in.,  
Width 6½ in., height 4½ in.



### ELECTRIC

### BOILING RING. List No. 57.

This will do all the same operations as an ordinary gas ring. Used for heating glue pots, and when loaded at 250 watts can be attached to any electric lampholder.

PRICE 15/-

Diameter 7 in.



### ELECTRIC

### HOT PLATE. List No. 18

Useful for keeping food warm, and also for drying purposes of all kinds.

PRICE 100/-

Size 36 in. by 18 in.



### ELECTRIC

### IMMERSION HEATER.

A reliable appliance for heating water, oil and other liquids. Can be easily fitted to existing tanks, etc.

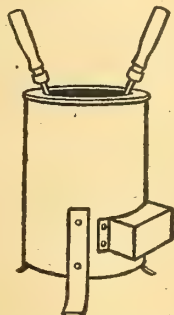
### ELECTRIC

### ENGINE WARMER.

For placing under engine in cold weather to prevent freezing. They are quite gas and fireproof.

PRICE 40/-

Size 12 in. by 7 in.



### ELECTRIC

### SOLDER POT. Type A.

This is the latest system for heating ordinary soldering irons, and consists of a pot of molten solder into which the irons are placed for a short time till heated.

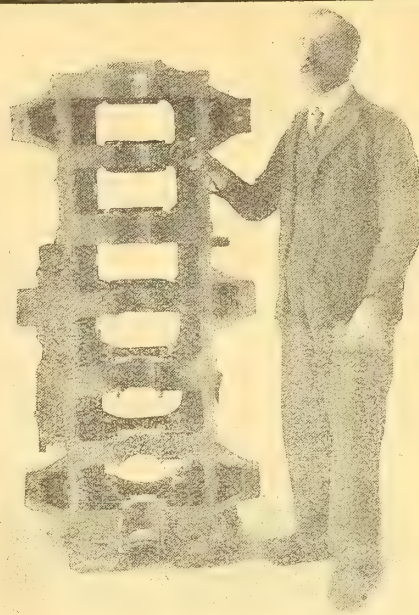
PRICE 65/-

Dimensions—Outside diam. 8 in.,  
inner pan 5½ in. diam. at top,  
Depth 7 in.

All the above prices are subject  
to an advance of 25 per cent.

Our Catalogue illustrates many other special appliances we make for Manufacturing Purposes, Munition and Factory Work, Hospitals, Mess Rooms, etc.

**BELLING & CO.,** MANUFACTURING  
ELEC. ENGRS.,  
DERBY RD. WORKS, MONTAGUE RD., EDMONTON, LONDON, N. 18



## We do a bit for a TANK

THE giant Aluminium Base Chamber illustrated is one of the largest ever made. It was badly fractured, and the makers told us to weld up three camshaft housings.

This base chamber belongs to a special Daimler engine, the original power unit of the Tank.

The owners of this big casting had some unfortunate experiences in Aluminium welding before sending this job to Barimar, but they were completely satisfied with the Barimar type of work, and sent many other jobs for expert treatment.

Our new 24-page Manual 'B.C.' entitled—  
"The Welding Test" is ready

This book contains information that every prospective user of Welding should know. There are so many who do not know the almost unlimited possibilities of Barimar Welding that this book, which is liberally illustrated with views of actual jobs done, will prove a surprise. The published price is 6d., but to any reader who has a broken part to be repaired, we will send a copy free if he asks for Manual "B.C." and mentions "THE AEROPLANE."

Heavy Repairs can be done on the Spot  
by our Travelling Staff

When sending repairs, remove fittings, label with your name and address, and send carriage paid. Post advice of dispatch to us.

Address Orders and Repairs to Dept. "B.C."—

# BARIMAR

LIMITED.

10, Poland Street, London, W. 1.

Telegrams: Bariquamar, Reg. London.

Telephone: Gerrard 8173.

EVERY-  
THING  
IS  
O. K.

ROYAL FLYING CORPS, YATESBURY, WILTS.  
Messrs. BARIMAR, Ltd. 29th Nov. 1917.

SIRS,—I thank you for your esteemed attention to the cylinder head which arrived this morning. I have since had the machine on the road and everything is O.K.—Yours faithfully,  
H. PUGHE LLOYD, 2nd-Lt. R.F.C.



SMALL FERRULE.  
PATTERN "A".

**WE CAN SUPPLY  
THESE AT ONCE**

Nos 1, 5 &amp; 6



Nos 2, 3 &amp; 4

SMALL FERRULES  
PATTERN "C".

IN VARIOUS GAUGES AND LENGTHS  
- SEND FOR FULL PARTICULARS -

# FERRULES FOR AIRCRAFT WORK

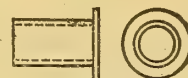
THE AEROPLANE STEEL TUBE AND PRESSWORK ARTIFICERS

SMALL FERRULE.  
PATTERN "B".

OLDBURY

BIRMINGHAM

Telegrams: "ACCLES," OLDBURY Telephone: OLDBURY 111 (4 lines)  
A.B.C. CODE, 5th Ed.

SMALL FERRULE  
PATTERN "D".

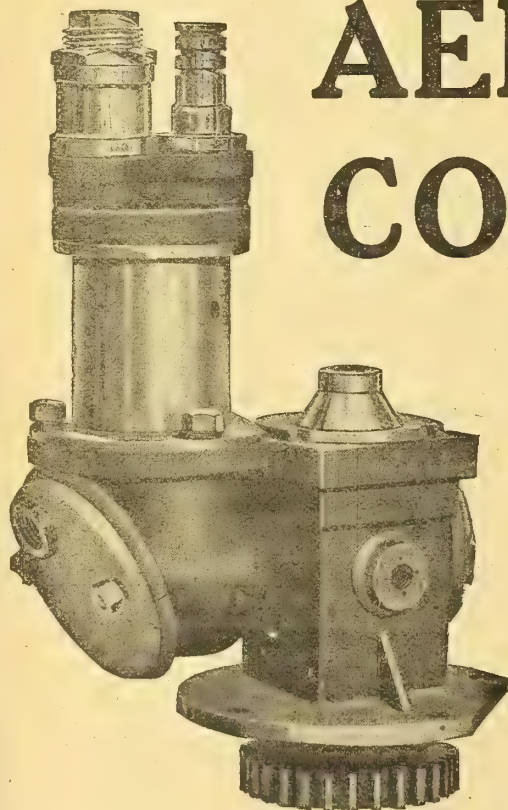
# AERO ENGINE COMPONENTS

MANUFACTURED BY THE

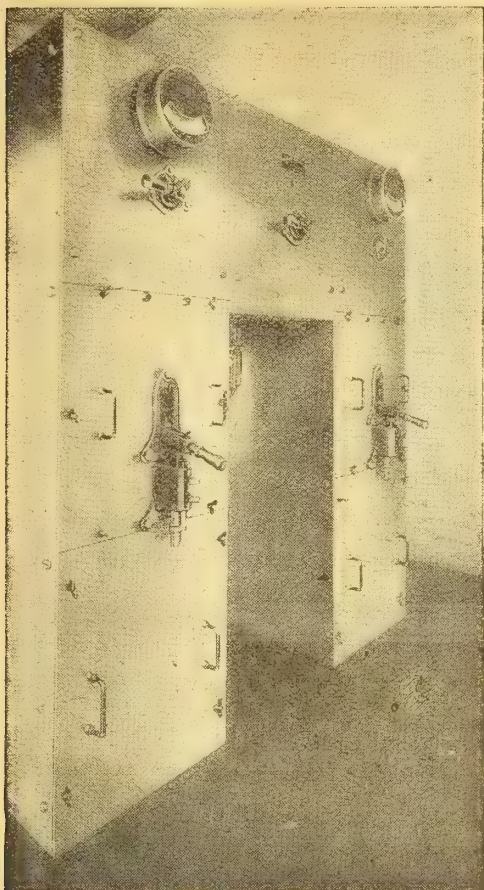
## SELSDON

**Aero and Engineering Co.  
Limited**

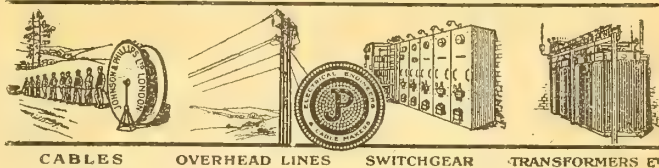
1, ALBEMARLE STREET,  
PICCADILLY, W.1.







SPECIALISTS IN ELECTRICAL TRANSMISSION AND DISTRIBUTION



*The Illustration shows a High-tension All-Steel Totally Enclosed Front Access*

## SWITCHBOARD

*of our standard construction, lately made and erected by us to control the incoming Power Supply, at 2,200 volts, in a well-known Aeroplane Works.*

*This type is particularly suitable where space is limited.*

12, UNION COURT, OLD BROAD ST., LONDON, E. C. 2

**JOHNSON AND PHILLIPS LTD**  
ELECTRICAL ENGINEERS & CABLE MAKERS  
**CHARLTON, LONDON, S.E. 7.**

BIRMINGHAM CARDIFF GLASGOW MANCHESTER NEWCASTLE-ON-TYNE PORTSMOUTH  
206, Corporation St. 9, Park Place, 159, W. George St. 251, Deansgate 44b, Blackett St. Cleveland Rd Gosport

# H. & O., Ltd.

## Harris & Others, Limited,

### AIRCRAFT CONSTRUCTORS,

## Old Town, Clapham, S.W. 4.

WOODWORK, METALS, COVERING AND DOPING.

Sub-Contractors to leading Aeroplane Builders.  
On Admiralty and War Office Lists.

Phone: Battersea-1236  
1047





# ARMSTRONG, WHITWORTH AIRCRAFT WORKS, NEWCASTLE ~ UPON ~ TYNE.



TELEPHONE :- 500 GOSFORTH.

TELEGRAMS :- ARMSTRONG AVIATION,  
NEWCASTLE ~ ON ~ TYNE.

## GWYNNES LIMITED

CONTRACTORS TO H.M. ADMIRALTY AND WAR OFFICE.

SOLE LICENSEES AND MANUFACTURERS IN THE BRITISH EMPIRE  
OF THE

### "CLERGET" PATENT AERO ENGINES.



WORKS & OFFICES: { CRISP ROAD, HAMMERSMITH, W.6. } LONDON.  
                          { CHURCH WHARF, CHISWICK, W.4. }

TELEPHONES: 1810 HAMMERSMITH (3 lines).  
                  1780 CHISWICK 3 lines).

TELEGRAMS: "GWYNNE, LONDON."



## PATENTS INDEX.

The subjoined list of recent inventions has been specially compiled by THE AEROPLANE from the current Official Patents Records.

## PATENT APPLICATIONS.

- Atterbury, J. J. Duplicating aeroplane propeller blades. No. 4424. March 13th.  
 Bibby, W. Propellers for aircraft, etc. No. 4507. March 14th.  
 Blakeborough, G. Oriented traversing arc and pointer for 18-pounder anti-aircraft gun. No. 4235. March 11th.  
 Brown, D. E. Hydro-aeroplanes. No. 4522. March 14th.  
 Clark, T. W. K. Aeroplanes. No. 4688. March 16th.  
 Colona, G. C. Respirator for use in aviation, etc. No. 4255. March 11th.  
 Cooke, C. J. Guns for aircraft. No. 4632. March 15th.  
 Daimler Co. Cylinders for aircraft internal combustion engines. No. 4519. March 14th.  
 Davies, E. Owen. Non-evaporating can for aeroplane dope, etc. No. 4383. March 13th.  
 Exley, W. H. Indicating apparatus for aerial machines, etc. No. 4614. March 15th.  
 Forbes, S. L. Sight for bomb-dropping, etc., for use on aircraft. No. 4524. March 14th.  
 Ford, L. C. Beams, spars, ribs, etc., for aerial machines. No. 4679. March 16th.  
 Gunn, A. H. Aircraft. No. 4243. March 11th.  
 Haggis, A. J. Aircraft. No. 4671. March 16th.  
 Harrington, J. A. Instrument for indicating level or angles for aircraft. No. 4578. March 15th.  
 Hollands, S. H. Aircraft propellers and air-propelling fans. No. 4381. March 13th.  
 Humphrey, J. E. Aeroplanes. No. 4669. March 16th.  
 Hutton, L. A. B. Aerial bomb. No. 4661. March 16th.  
 James, H. V. Means for determining travel speed of aircraft. No. 4434. March 13th.  
 Kennedy, C. J. H. Mackenzie. Aeroplanes. No. 4686. March 16th.  
 Kennedy, C. J. H. Mackenzie. Aeroplanes. No. 4688. March 16th.  
 Kozlowski, J. de. Apparatus for measuring and indicating altitude and distance. No. 4226. March 11th.  
 Leinekugel le Cocq, G. A. A. Hangars for dirigibles. No. 4332. March 12th.  
 Morley, J. W. H. Automatic aerial bomb and discharge tube. No. 4602. March 15th.  
 Newell, C. A. Automatic range-finder and sight-setter for anti-aircraft guns. No. 4431. March 13th.  
 Page, F. H. Aeroplanes, etc. No. 4593. March 15th.  
 Page, F. H. Aircraft structures. No. 4594. March 15th.  
 Parham, D. Anglemeter for use on aircraft, etc. No. 4222. March 11th.  
 Pickford, E. H. Turnbuckles for aircraft, etc. No. 4575. March 15th.  
 Purdie, E. J. Level, etc., for aircraft. No. 4463. March 13th.  
 Robbins, J. Material for covering wings of aircraft. No. 4646. March 15th.  
 Sherlock, G. Means for observing and detecting aircraft. No. 4511. March 14th.  
 Spencer, S. E. Apparatus for direction of flight of aeroplanes. No. 4605. March 15th.  
 Spencer, S. E. Apparatus for indicating variation from the horizontal in aeroplanes. No. 4606. March 15th.  
 Vickers, Ltd. Aerostat structure of rigid airships. No. 4549. March 14th.  
 Vickers, Ltd. Rigid airships. No. 4557. March 14th.  
 Vickers, Ltd. Cars for aerial machines. No. 4559. March 14th.  
 West, C. Means for locating aircraft, and apparatus for attacking same. No. 4521. March 14th.  
 Wilson, H. F. Aircraft. No. 4617. March 15th.

COMPLETE SPECIFICATIONS ACCEPTED, PRINTS OF WHICH CAN BE OBTAINED ON AND AFTER APRIL 4TH, 1918.

- 113,827. March 7th, 1917. Parnell, G. W. Wood pins for use in jointing laminæ of aeroplane propellers.  
 113,833. March 8th, 1917. Middleton, H. Steering screw propellers.  
 113,874. May 7th, 1917. Pease, W. H. Spring buffers for use in the landing gear of aircraft.

## ABRIDGMENTS OF RECENTLY PUBLISHED SPECIFICATIONS.

- 112,685. **Aeronautics.** BLAYNEY, R. O., 245, River Road, Niagara Falls, Ontario, Canada.

**AERIAL MACHINES WITHOUT AEROSTATS; PROPPELLING; STEERING.**  
 —An helicopter machine has the lifting-screws arranged so that their axes of rotation can be adjusted in both transverse and longitudinal planes, and is provided with collapsible planes adapted to be opened out if the engine stops. The lifting-screws 8 are carried by arms 6 which may be adjusted about their own axes by connections attached at their inner ends 5.

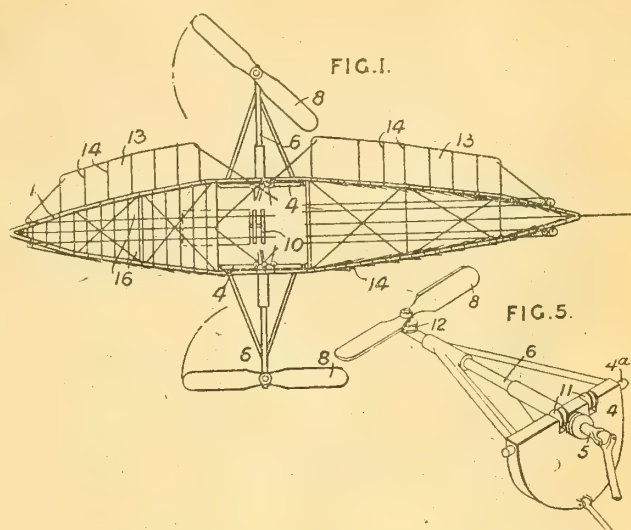


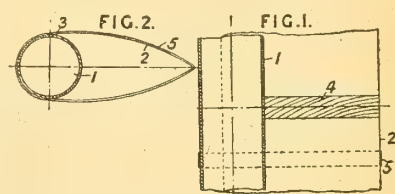
Fig. 5, and also about longitudinal pivots 4a by swinging plates 4 in which the arms 6 are mounted. The screws may be driven by belts extending from pulleys 10, Fig. 1, over pulleys 11, 12, Fig. 5.

**PLANES, CONSTRUCTION AND ARRANGEMENT OF.**—Series of fins or planes 13, comprising fabric stretched between ribs 14 pivoted to the outer sides of the frame 1, may be swung outwards or folded against the frame. Similar planes 16 may be extended inwards from the inner sides of the frame 1 or folded within the channel side members of the frame.

**FRAMEWORK.**—The frame 1, having side bars of channel section, is of square formation transversely and tapers towards both ends.

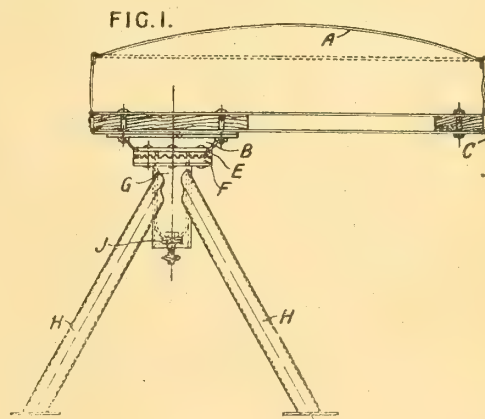
- 112,688. **Aeronautics.** LIVERSEDGE, A. J., 14, Great Smith Street, Westminster.

**FRAMEWORK.**—Struts or other members for aircraft are composed of a tube 1 to which is attached a metal strip 2 bent to streamline form, the whole being strengthened by internal blocks 4 and external bands 5.



- 112,641. **Aircraft.** SOPWITH AVIATION CO., and SOPWITH, T., Kingston-on-Thames.

Relates to seats for gunners on aircraft of the kind capable of an all-round movement about an eccentric pivot on a fixed stand, and consists in providing means for automatically locking the seat to the stand when the seat is occupied, and for unlocking the seat when it is relieved of the weight of the occupant. In the form shown, the wooden frame C of the seat



A carries a vertical pivot B having a toothed ring E which is pressed, by the weight of the gunner acting against a spring J, into engagement with a toothed ring F carried by a fixed socket G supported by legs H. The engagement between the teeth serves to fix the seat in the desired position, but disengagement automatically takes place under the action of the spring J when the gunner raises himself slightly, and the seat may then be freely rotated in the socket G.





## Get into touch with "ASCOL" Representatives

IN order to bring our business into closer touch with Aircraft Manufacturers throughout the country, we have now appointed representatives in Lancashire, Yorkshire, the Midland Counties, and Ireland (*see below*). We shall shortly appoint other representatives for the Eastern and Western Counties, details will be announced later. Three representatives are attached to our Head Offices at Long Acre for the London District.

These gentlemen will call regularly, and will keep firms posted as to stocks in hand and deliveries expected. We trust that our clients will make use of their services, to the advantage of all concerned.



Managing Director—G. H. MANSFIELD.

Works—Little James St., London, W.C.1.

Telephone—Gerrard 276 (Private Branch Exchange.)

Telegrams—"Upcast, Rand," London.

### LANCASHIRE DISTRICT.

C. T. CHIVERS, 36, Corporation Street, MANCHESTER.  
Telephone—6942 City.

### IRELAND.

F. COE WILSON, 149, Donegal Street, BELFAST.  
Telephone—297. Telegrams—"Comfort," Belfast.

### SOUTH COAST.

J. S. BIRKS, 93, Above Bar, SOUTHAMPTON.  
Telephone—40 Southampton.  
Telegrams—"Upcast, Southampton."

### MIDLAND COUNTIES.

L. J. SERIN, 36, International Exchange, Edmund Street, BIRMINGHAM.  
Telephone—982 Central. Telegrams—"Upcast, Birmingham."

### YORKSHIRE DISTRICT.

H. DE GREY FIRTH, Prudential Buildings, Park Row, LEEDS.  
Telephone—3829 Central. Telegrams—"Jupiter, Leeds."

## THE AIRCRAFT SUPPLIES COMPANY LTD

CONTRACTORS TO THE AIR BOARD.

Head Offices, Showrooms, and Stores:

ASCOL HOUSE, 125, LONG ACRE, LONDON, W.C.2.

ASCOL



# THE AIRCRAFT TRADER

## MARKET TOPICS.

(Prices are for quantities on usual terms.)

March 21st, 1918.

**COPPER.**—Supplies are being well maintained, and recent reports from U.S.A. indicate that railway facilities have considerably improved. The situation generally is much better than it was a month ago. There has been no alteration in the official controlled prices.

**TIN.**—The most serious feature of this market is that we are apparently faced with a serious shortage of supplies, and the position in U.S.A. is worse than what it is here.

Very few shipments have arrived lately, consequently sellers have very little tin to offer. This is the only metal which is not controlled by the Government, but is now being controlled by a Licensing Committee of the London Metal Exchange, who are doing their best to deal satisfactorily with a very complex problem.

Prices here are fairly steady.

### COMPARATIVE PRICES.

	Per ton.
To-day, 20th .....	£320 0 0
March 14th .....	322 0 0
March 7th .....	319 0 0
Last year .....	203 15 0
Highest price, 1917 .....	309 0 0

**LEAD.**—The position of this market remains unchanged.

**STEEL.**—The general situation is most satisfactory; notwithstanding the ever-increasing demand for special aircraft steels, production is reaching high-water mark and ample supplies are available. There has apparently been a little shortage of raw material, but nothing to cause alarm.

The output of Cast Steel continues to increase and supplies are a little easier. Prices of all steels remain unchanged.

**TIMBER.**—The question of supplies is still most unsatisfactory. Furthermore, it is reported that the United States of America is retaining its own share of Silver Spruce and distributing the remainder among the Allies. Notwithstanding this, the position is most serious.

There have been very few shipments of Aeroplane Timber received recently. Presumably food is taking first place, as far as freightage is concerned, and it is only natural to assume that there is very little room left for Timber.

The demands during the next six months will be very heavy indeed, and unless there is an improvement very quickly, there appears to be no hope whatever of satisfying them. Very little Mahogany has been received lately.

Prices continue very firm.

**FABRIC.**—The time is rapidly approaching when constructors will be compelled to put Cotton Fabric to more extensive use owing to the shortage of Linen Fabric; the latter being chiefly due to the difficulty in obtaining sufficient flax.

It is reported that steps are being taken to increase the flax crop, but it is very doubtful whether the increased crops will enable the mills to turn out sufficient Linen Fabric to meet all demands.

The advance which was foreshadowed in THE AEROPLANE last December has now taken place. The official notification states that these revised prices govern all issues of Fabric in connection with aircraft contracts as from the date of this notification, i.e., March 16th, 1918.

### PRICES.

Set and Quality.	Width.	Name.	Identification Letter.	Price per Lineal Yard.
18 x 18	36in.	English Standard .....	A	3/1
12 x 14	36in.	American Sub-Standard ....	B	2/3
14 x 13	39½in.	British Sub-Standard ....	C	2/8
16 x 15	39½in.	French Standard .....	D	3/-
13 x 12½	37½in.	Spaced Fabric .....	½in. Spaced	2/1

The above prices include cost of inspection (previously carried out) and delivery to the goods railway station nearest to constructors' works.

## AN ASCOL LUNCH.

On Thursday, March 21st, Mr. George H. Mansfield, managing director of the Aircraft Supplies Company, Ltd., of 125, Long Acre, entertained a representative gathering of those concerned with aircraft production to lunch at the Holborn Restaurant, for the purpose of meeting his provincial representatives.

Despite the limitations imposed by the Food Censor, an excellent repast was served, at the conclusion of which some educative speeches were wrapped round the various toasts.

Mr. Henry Knox proposed the toast of the Royal Air Force, and in a characteristic speech spoke of the honour which he felt at being probably the first man in history to propose this toast, and, with a merry story to give point to his remark, suggested that, if anything, the toast was premature.

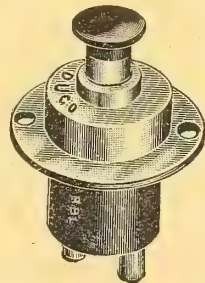
Lieut. Horne, R.N.V.R., replied, and gave expression to the appreciation of the Flying Services of the assistance rendered to them by the Aircraft Industry.

Mr. Stuart A. Hirst, of the Blackburn Aeroplane and Motor Company, Ltd., gave an interesting dissertation on the art of salesmanship, apparently of the American order, in which he compared the merits of Health, Head, and Horse Sense as assets in salesmanship.

Mr. Robert Blackburn pointed out the mistake made by many pioneer firms in taking a pride in manufacturing every part of an aeroplane themselves, and advocated the use of the greatest number of standard parts possible with the objects of speeding up production and the facilitation of change in design.

Mr. George H. Mansfield thanked his agents for the help they had given him, and also those members of the Aircraft Industry who had assisted those of them who, coming fresh from the Services, had needed education respecting the technical aspect of their work.

## A NEAT FITMENT.



Brown Brothers, Ltd., of Great Eastern Street, E.C.2, have placed upon the market a cleverly-contrived engine switch which is designed to be countersunk into the top of the control lever of aeroplanes. It is made almost entirely of brass and fibre, and, besides being useful, affords a distinct finish to the top of the control lever. It is of the spring cut-out variety. That is to say, pressure of the button shorts the current through the low tension circuit. As soon as pressure is released the magneto functions again, because a spring in the switch breaks the circuit.

there being no need for the pilot to place the switch in the "on" position by manual dexterity.

The device is marketed for Avro and other types of aeroplanes, and inquiries are invited by the firm.

## FIAT AFFAIRS.

An announcement which has appeared in several English newspapers to the effect that the Fiat Company has established new steel works in Austria is calculated to give the impression that the leading Italian motor-car company is interested in industrial development in an enemy country. It is, therefore, necessary to point out that there is no connection between the Fiat Company of Turin, Italy, and the Fiat Werke, of Vienna.

In 1907 the Italian Fiat Company collaborated with a number of prominent Austrian business men in the establishment of an Austrian branch known as the Fiat Werke, just as was done in England, Russia, Germany, and the United States. This Austrian company secured the right to Fiat patents, to make use of the name of Fiat, and to sell Fiat cars on Austrian territory. The Italian directors of the Fiat Company sold their holdings in the Austrian company within a very short time, but the agreement with regard to patents and agency continued until the outbreak of war.

At this time all connection between the main Fiat Company at Turin and the Austrian filial was broken, the Italian Fiat officially informing the Fiat Werke that the right to make use of the title "Fiat" was unconditionally withdrawn, and that the Austrian company was no longer entitled to make use of Fiat patents or trade marks. At the same time, Signor Marchesi, one of the directors of the Italian Fiat Company, resigned his position as director of the Austrian Fiat Werke.



The Worst Poison Gas  
defied by—

# "TRIPLEX" SAFETY GLASS

Gas Masks fitted with goggles of "Triplex" are absolutely dependable. Even when badly smashed through concussion or shrapnel this wonderful glass still remains gas-proof. "Triplex" cannot be splintered. It always remains intact. Not even the smallest particle can break loose to damage the sight. "Triplex" goggles are extensively used by Aviators, Despatch Riders, etc. Prices from 7s. 6d.

*Catalogue Mailed Free on Request.*

**THE TRIPLEX SAFETY GLASS CO., LTD.**

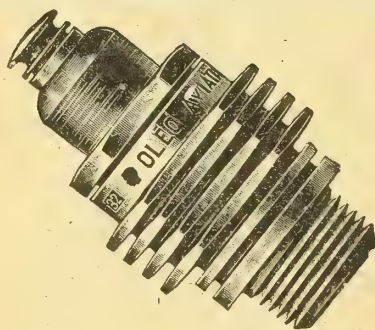
(REGINALD DELPECH, MANAGING DIRECTOR)

1, ALBEMARLE STREET, PICCADILLY, LONDON, W.1.

Telephone—1340 Regent.

Telegrams—"Shatterlys, Piccy, London."

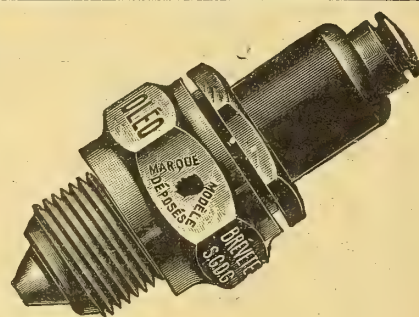
**CONTRACTORS TO H.M. GOVERNMENT**



TYPE No. 32.



"The Smile of Success."



TYPE No. 27G.

OLEO were the first Aero Plugs ever made.

OLEO won the Aero Grand Prix **SIX TIMES** in succession.

OLEO Plugs have been supplied to the Government since 1913.

OLEO Aero Plugs have the "**Largest Sale in the World.**"

OLEO Plugs have won over £30,000 in prizes.

OLEO Plugs were the first to Loop the Loop.

OLEO Plugs were the first to Cross the Alps.

OLEO Plugs are supplied to NINE Governments.

# OLEO

## PLUGS

LEO RIPAULT & CO.

64A, POLAND ST. LONDON, W.

TELEGRAMS: RIPAULT, REG. LONDON. TELEPHONE: GERRARD 7758.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# AIRCRAFT FINANCE

## D. NAPIER AND SON, LTD.

The further expansion of profits shown in the report of this company for the year ended Sept. 30th last, just issued, once again calls attention to the satisfactory progress of this undertaking, which is duly demonstrated by the fact that the £1 ordinary shares quoted at a discount in the early part of this year (i.e.), at 18s.-19s., are at present quoted 35s.-36s. The report to hand states "that the profit, after allowing for depreciation, amounted to £129,499; £9,557 was brought forward, making £139,057. A dividend of 10 per cent., less tax, on Ordinary shares was paid Jan. 4th last, and the directors now recommend a bonus of 1s. 6d. per Ordinary share, free of tax: to place to general reserve £20,000 (making £60,000), carrying forward £18,739. The output exceeded that of any previous year.

The Company has done remarkably well since the commencement of the war, the dividend having been raised from 6 per cent. for 1914 to 10 per cent. last year, and although the rate of dividend just declared is the same, there is an additional bonus of 1s. 6d. per share distributed free of income tax, and the carry-forward is increased from £9,600 to £18,700.

The recent visit of H.M. the King to the works, no doubt, was duly regarded as an advance note of something out of the ordinary running, and it is now an open secret that great things are expected of the new aerial engine in course of completion by the company.

### THE ANNUAL MEETING OF THE COMPANY.

The adjourned fourth ordinary general meeting of shareholders was held on Wednesday last at the Company's registered offices at Acton. Mr. H. T. Vane, C.B.E. (Joint Managing Director), presided, in the absence of Mr. Montague S. Napier (the Chairman), in consequence of indisposition. The Chairman, in moving the adoption of the Report, said:—

"The financial position of your company as set out in the balance-sheet will, I think, be regarded as very satisfactory, especially when you take into consideration the abnormal conditions under which we have been working during the year. The increased cost of labour and material, and the delays experienced in obtaining delivery of the latter, have been serious difficulties to contend with, and I would like to record my thanks, as well as those of my co-directors, to the employees and staff, who have put forth their best efforts to increase the output.

"The result has been that we have far exceeded any previous year's output, which has been entirely for Government requirements, and it is our intention during the present year to endeavour to do even better in that direction when we have our new building complete and our new plant in operation."

The Chairman then went on to review the future, and predicted that the industry would rapidly prove a great financial success, and closed his able speech with a well-timed and serious note of warning in the following words:—

"There is great need, however, for proper adequate Government protection for the trade, especially during the few years following the conclusion of peace. We have to rebuild our sales organisations, and to put our factories on a peace footing, which is very distinct from a war footing, and we look to the Government to aid the industry in this direction, especially having regard to the patriotic way in which the whole industry has adapted itself to Government requirements and loyally supported them during the course of the war.

"I have pleasure in reporting that since our last meeting Mr. Lindsley Byron Peters, M.I.M.E. (Chairman of G. D. Peters and Co., Ltd.; director of Gwynnes, Ltd.), has been elected to the Board of Directors."

Mr. W. H. White (Director) seconded the report, which was carried unanimously.

The Chairman then proposed that a final distribution by way of bonus be made to the Ordinary shareholders of 1s. 6d. per share, free of income-tax.

Mr. L. Byron Peters said: "I have very much pleasure in seconding this resolution. As you have heard I only recently joined the Board, by the consent of your Chairman and his co-directors. Before doing so I made searching inquiries with regard to the personnel and financial position of the company, and they were in all cases highly satisfactory. Your Chairman, Mr. M. S. Napier, has a world-wide reputation in the motor industry, and it will never be forgotten that he designed and built the car

that first won the Gordon-Bennett Cup (the blue ribbon of the motor world) for this country, and your company, which bears his name, has always held a leading position in the industry. Mr. Vane, your Joint Managing Director, is a man of wide business experience, coupled with technical knowledge, and has been of great service to the country during the war. I am sure we all congratulate him on the honour he recently received from His Majesty the King. Mr. White is a man of figures, and I have been greatly impressed with the perfect system of accounts and records he has set out for the guidance and smooth working of your company. The accountant to-day plays a very important part in all up-to-date concerns, where costing is a vital necessity. And last, but not least, Mr. Cooke represents law, and he sees that your company treads the straight path and keeps us out of trouble."

## INCOME-TAX CONSOLIDATION.

The introduction of a Bill into the House of Lords with the object of making the existing law of income-tax intelligible to ordinary people marks a stage in dealing with a task which must be grappled with sooner or later. The fact that the Bill covers 267 pages shows the magnitude of the task of attempting to "consolidate" income-tax law as it now stands. Such a measure is urgently needed, but if changes occur as frequently in the next few years as they have done recently the Act would merely become a foundation upon which a fresh structure of statute and case law would be erected.

G. A.

## COMPANIES ANNOUNCEMENTS.

### NEW COMPANIES REGISTERED.

*The files of the following new companies are available for inspection at Somerset House.*

**TURNBUCKLES, LTD.** (Private Company).—Registered March 14th. Capital, £3,000 in £1 shares. Manufacturers of, agents for, and dealers in motor and other vehicles and accessories, internal combustion, electrical and other engines, aircraft, motor boats, submarines, torpedoes, cycles, arms, munitions, tools, etc. The subscribers (each with one share) are: P. W. Moll, 28a, Basinghall Street, E.C. (accountant); F. W. Bowditch, 110, Kirkwood Road, Peckham, S.E.15 (accountant's clerk). The first directors are: C. A. Harrison, F. H. Arnott, and F. H. Wright. Registered office: 28a, Basinghall Street, E.C.

**OKLANDS ENGINEERING CO., LTD.** (Private Company).—Registered March 14th. Capital, £1,000 in £1 shares. Manufacturers of and dealers in motors, motor cars, motor accessories, cycles, aeroplanes and dirigible balloons, electrical and general engineers, etc. The subscribers (each with one share) are: A. H. Preen, The Bungalow, Station Road, Amersham, Bucks; E. de Laspée, 14, Crown Terrace, Cricklewood (engineer). The first directors are: A. H. Preen and E. de Laspée. Qualification: 1 share. Registered office: 17, Basinghall Street, E.C.2.

**LECONFIELD AIRCRAFT WORKS, LTD.** (Private Company).—Registered March 15th. Capital, £1,000 in 1,000 preference shares of 1s. each and 950 ordinary shares of £1 each. To acquire an interest in, or tenancy of, the Leconfield Works, Canonbury, N., and to carry on the business of aircraft manufacturers; sheet metal workers and dealers, electricians, electrical engineers, etc. The subscribers (each with one share) are: F. Lavy, 9, Fenchurch Buildings, E.C.3. (solicitor); A. Allinckx, 3-4, City Road, E.C.1. (manufacturer); L. Van de Putte, 352, City Road, E.C.1 (metal founder); F. Van Pee, 10, Arseh Road, West Kensington, W. (engineer); J. Van de Putte, 760, Fulham Road, S.W. (engineer); A. H. Oliver, 9, Fenchurch Buildings, E.C. (accountant). The first directors are: A. Allinckx, L. Van de Putte, F. Van Pee and J. de Putte (all permanent). Registered office: 354, City Road, E.C.1.

### MORTGAGES AND CHARGES.

**PORTRHOLME AIRCRAFT CO., LTD.**—Registered March 5th, 1918. Debenture for £15,000 charged on leasehold property and freehold ground, etc., at Huntingdon and general charge on the company's assets.



**SATISFACTION.**

**AIRCRAFT MANUFACTURING CO., LTD.**—Satisfaction registered March 7th, 1918, of £16,650, filed May 1st, 1914.

**COMPANY'S WINDING-UP PROCEEDINGS.**

**POROTHOLME AERODROME, LTD.**—Resolved Feb. 19th, 1918, confirmed March 7th, 1918: "That the company be wound up." Wm. W. Knapman, 27, Rood Lane, E.C., liquidator, empowered to carry into effect the sale of the assets of the company to the Portholme Aircraft Co., Ltd., in terms of an agreement executed between the company and the Portholme Aircraft Co., Ltd., meeting of creditors at the liquidators, March 22nd, 1918, at 3.15 p.m.

**ANSWERS TO CORRESPONDENTS.**

*Enquiries on any subject relating to Investments, Stocks, Shares and Securities of aircraft or kindred companies will be answered in these columns, free of charge.*

*Letters should be accompanied with the names and address of the writer (solely as evidence of good faith) and the correspondent should adopt a "nom de plume" under which the reply will appear.*

"DATA."—A company is not "lawfully assembled" to pass qualified resolutions unless it is held upon such notice as would give every member the opportunity of being present. Under "Table A" of the Companies Acts (Sec. 35), seven clear days' notice is requisite. This means excluding the day of giving the notice as well as the day of the meeting.

"EXCEL."—Any person dealing with a Company is deemed to be cognisant of the documents officially filed by the Company at Somerset House. It would be no reply in law for you to assert that you were unaware of the limitations imposed upon the Managing Director by the Articles of Association. The Companies Acts compel the Company to file such documents for the express purpose of giving information to interested parties; if you neglect to take such reasonable business precaution you cannot expect sympathy.

"OFFICIAL."—The Statutory Rules and Orders issued by the Lords of H.M. Most Honourable Privy Council under the Section dealing with "Trading with the Enemy" are published at irregular periods by the Government, and may be ordered through any bookseller. The Consolidating Statutory List No. 41A (price 6d.) gives the complete list to December 7th, 1917. The subsequent issues are No. 42, issued Dec. 21st, 1917; No. 43, issued Jan. 4th, 1918; No. 44, issued Jan. 11th, 1918; and No. 45, issued Jan. 18th, 1918, and cost one penny each.

"A. C. A."—The law on the point is, as you say, delightfully vague. The common form in practice was secured by a joint opinion to the Chartered Institute signed by Sir Robert Finlay, K.C., Mr. Felix Cassel, K.C., Mr. A. R. Kirby and Sir F. B. Palmer, and dated March 13th, 1908. The Institute will no doubt send you a copy on application.

"JANET."—(1) No company with such a title appears on the files. (2) Apparently the final call of 5s. per share.

"PILOT."—Your proper course is to spread your investments, say, into three categories. In the first category, comprising sound Government investments bringing in 5 per cent., you would invest say 50 per cent. of your available funds; in the second category, comprising sound industrials yielding  $7\frac{1}{2}$  per cent., say 30 per cent.; and the balance (20 per cent.) in the third category, consisting of sound shares but a little more speculative, which should yield, say, 10 per cent. In this way your capital would give you  $6\frac{1}{2}$  per cent. per annum.

"PILOT."—Special provision is made in the Finance Acts providing that the Commissioners of Inland Revenue may, in all cases where they think it necessary, permit Excess Profits Duty to be paid in instalments.

"REX."—The Companies Acts permit a company limited by shares to sub-divide the shares into smaller denominations (e.g.) shares of ten pounds each may be converted into ten times the number of shares of £1 each. This can be done by "Special Resolution" passed at a meeting of shareholders.

"REBATE."—If the full tax has been paid (or deducted from dividends, ground rents, mortgage interest, etc.) and the rebate has not been allowed by the Inland Revenue as a deduction from tax paid under Schedule D or property tax, this allowance may be claimed back from the Inland Revenue at any time within three years.

"R.F.C."—Shareholders of a company governed by "Table A" of the Companies Acts have one vote for every share held by them up to ten, an additional vote for every five shares up to one hundred, and another vote for every further ten shares. Consequently your holding would give you 38 votes at the meeting. G.A.

**THE FAIRBY CONSTRUCTION CO., LTD.**

Behind the announcement of the fact that two members of the board of the Fairby Construction Company, Ltd., have resigned their directorships are certain circumstances which denote that Mr. G. H. Humphrey has resumed his association with the management of the firm, after an interval of twelve months, by purchasing the interests of the other shareholders, and that the enterprising policy of this building company (the first firm to specialise in the erection of aircraft buildings) will be resumed with every prospect of even greater success than marked its earlier operations.

Mr. R. C. Wood is returning to the firm, and with Mr. G. Harrison is joining Mr. Humphrey and Major Walker on the board.

The company have recently taken larger offices at 317, High Holborn, W.1., telephone 1875 Holborn (two lines). The telegraphic address still remains as before—Bizzibild, London.

**A LAW CASE.**

A case of considerable interest to aircraft manufacturers came before the Westminster County Court recently, when Mr. Malcolm Macpherson sued the Cowper Coles Aircraft Co., Ltd., of Sunbury-on-Thames, for the sum of £37, being salary for four weeks at £6 per week, and bonus for 13 weeks at £1 per week. The real point at issue for His Honour, the Judge, to decide was whether a person in the position of the plaintiff was entitled to give or receive more than a week's notice to terminate his service.

The facts, which were not disputed, were that in the month of October last the plaintiff was appointed by the chairman, who was also managing director of the company, as superintending engineer of the aircraft work at a salary of £6 per week and a bonus of £1 per week.

On Dec. 20th the plaintiff wrote a letter to the chairman and managing director resigning his position in the company, such resignation "to take effect one month from the date" thereof. On the same day the chairman wrote the plaintiff accepting the resignation with regret. A few days afterwards the matter was reported to the board of directors, who passed a resolution declining to accept the resignation, and deferring the consideration of the matter. This was verbally reported to the plaintiff.

In the early part of January, however, the secretary of the company informed the plaintiff that he would receive no more wages, as one of the directors of the company objected to anyone having or giving more than a week's notice.

The plaintiff reported this to the chairman, who instructed him to continue to work out the period of his notice; and the plaintiff daily attended to his usual work under the direction of the managing director until Jan. 19th, when his notice expired.

The plaintiff thereupon brought the present action to recover his wages and bonus.

His Honour, in giving judgment for the plaintiff for the full amount of his claim and costs on the higher scale, including counsel, said that employers should discriminate between an employee in the position of the plaintiff, who was admittedly an able and practical engineer, and an ordinary workman, as it was not always easy for a man in a high position to obtain another situation in a week.

**CURRENT SHARE QUOTATIONS.**

March 26th, 1918.

Aircraft Mfg. Co. 7½ cum. pref. £1 ... 22/- 23/-	General Electric 6½ cum. pref. £10 ... 10½ 10½	Triplex Safety Glass, £1 ordinary ... 27/- 28/-
7½ cum. & ptg. "B" ... 19½ 20	Co., Ltd. £10 ordinary ... 19½ 20	Vickers, Ltd., 5½ pref. stock ... 78 82
pref., (fully paid) ... 22/- 23/-	Gwynnes, Ltd., 5½ cum. pref. ... 5½ 5½	5½ pref. shares. £1 ... 17/6 18/-
Armstrong (Sir W. G.) Whitworth & Co., Ltd. 4½ cum. pref. £5 ... 3½ 3½	Ordinary ... 33/- 34/-	£1 ordinary ... 43/- 44/-
5½ 2nd. pref. £1 ... 17/- 18/-	Greenwood & Batley, Ltd., £10 ordinary ... 13½ 14	Wm. Beardmore & Co., Ltd., 6½ c. pf. £1 18/- 19/-
£1 ordinary ... 42/- 43/-	Humber, Ltd., 6½ cum. pref. £1 ... 15/- 15/6	
Austin Motor Co., Ltd. 7½ cum. pref. £1 ... 18/6 19/6	£1 ordinary ... 20/- 21/-	
£1 ordinary ... 26/- 27/-	Napier (D) & Son, Ltd., 7½ cum. pf. £1 ... 19/- 20/-	
Birmingham Small Arms Co., Ltd. £1 ordinary ... 58/- 59/-	£1 ordinary ... 34/- 35/-	
5½ cum. "A" pref. ... 4½ 4½	Peter Hooker, Ltd., £1 7½ cum. partic. 1st pref. ... 19/- 20/-	
6½ cum. "B" pref. ... 20/- 21/-	Rolls Royce, Ltd., £1 ordinary ... 72/- 73/-	
Boulton & Paul, Ltd., 5½ cum. pref. £1 ... 4½ 4½	Rudge Whitworth, Ltd., £1 ordinary ... 45/- 46/-	
Brown Bros., Ltd., 6½ cum. pref. £5 ... 4½ 4½	Ruston, Proctor & Co., Ltd., 5½ cum. pref. £1 ... 16/- 17/-	
Darracq (A) & Co., £1 ordinary ... 35/- 36/-	Sunbeam Motor Car Co., Ltd., £1 ord. ... 78/- 79/-	
(1905) Ltd. 7½ cum. pref. £1 ... 23/- 24/-	Straker Squire, Ltd. (1913), £1 ordinary ... 22/- 23/-	
Electric Construc- tion Co., Ltd. 7½ cum. pref. £1 ... 20/- 21/-	S. Smith & Son, Ltd. (Motor Accessories) £1 ordinary ... 28/- 29/-	
£1 ordinary ... 25/- 26/-		
Fellows Magneto Co., 8½ cum. partic. pref. ... 17/- 17/6		

**GENERAL INFORMATION.**

Armstrong, Whitworth (1916).  
Austin Motor (1916).  
B'ham. Small Arms (1915-16).  
Rolls Royce.  
Rudge Whitworth.  
Straker-Squire (1915).  
Sunbeam Motor.  
Thornycroft (J. I.) & Co.  
Vickers (1915 and 1916).

Owing to the difficulty of estimating liabilities under Finance and Munitions Acts, the accounts will not be ready until a later date.

x—ex dividend



## B. T. H. Magnetos

are characterised by correctness of design, soundness of construction and reliability in service. It follows that if, when peace comes, you always specify B.T.H. Magnetos, you will secure high quality magnetos which give economical and thoroughly satisfactory service.

Entire present output requisitioned for war purposes.  
Member of the British Ignition Apparatus Association.

The **BRITISH THOMSON-HOUSTON CO., Ltd.**

:: Electrical Engineers and Manufacturers ::

Lower Ford Street — Coventry — England.



## THERMOMETERS

(Mercury-in-Steel Type).

For indicating or recording temperatures from  
—40° to + 1000° F.

—  
RIGID STEMS OR  
FLEXIBLE STEEL  
CAPILLARY  
TUBING.  
—

Various Types of  
Bulb Connections.  
—

**ROBUST.  
ACCURATE.**

*Dials 8 in. or 13 in.  
in Diameter.*

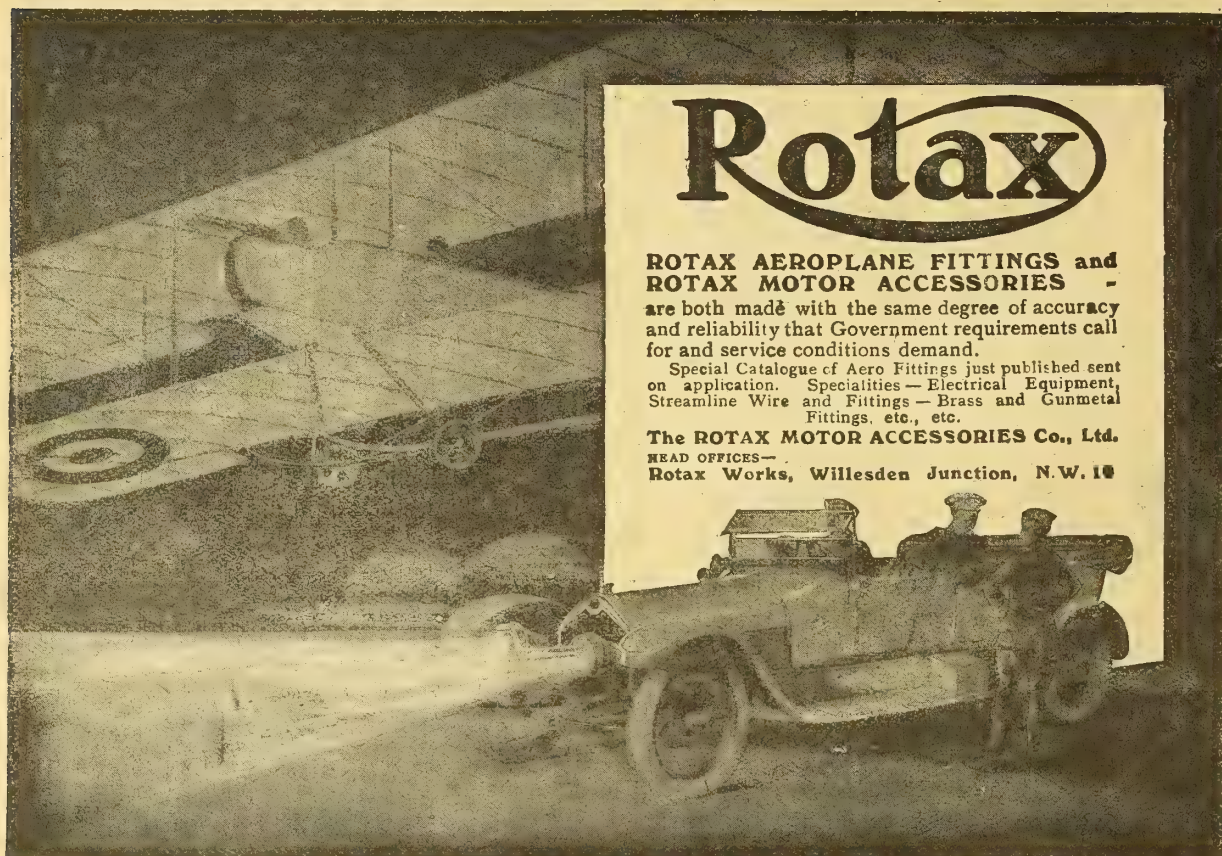
*Charts 9½ in. in  
diameter.*

FOR FULL PARTICULARS SEE LIST No. 112 M.

**THE CAMBRIDGE SCIENTIFIC INSTRUMENT CO., LTD.,**  
CAMBRIDGE — ENGLAND.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.





# Rotax

**ROTAX AEROPLANE FITTINGS and ROTAX MOTOR ACCESSORIES** - are both made with the same degree of accuracy and reliability that Government requirements call for and service conditions demand.

Special Catalogue of Aero Fittings just published sent on application. Specialities - Electrical Equipment, Streamline Wire and Fittings - Brass and Gunmetal Fittings, etc., etc.

**The ROTAX MOTOR ACCESSORIES Co., Ltd.**  
HEAD OFFICES -  
Rotax Works, Willesden Junction, N.W. 10

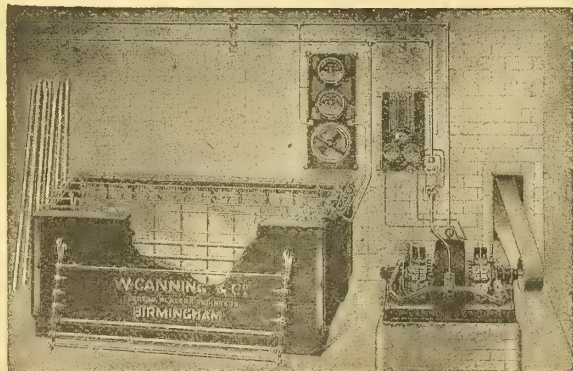
## **W. CANNING & CO.** *Lustre Works, Gt. Hampton Street.*

# **BIRMINGHAM**

AND 18/20, ST. JOHN'S SQUARE,  
CLERKENWELL, LONDON, E.C. 1.

### MANUFACTURERS OF

Motor Generators, Low Voltage Dynamos, Vats,  
Chemicals, Complete Plant for  
**ELECTRO - ZINCING (COLD GALVANIZING)**

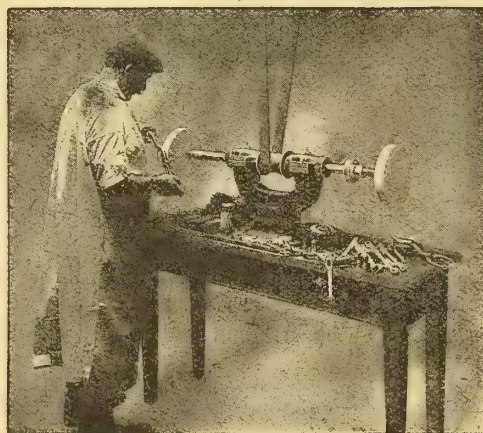


For Aeroplane Stay Wires, Connections.

**Also NICKEL, COPPER AND BRASS-  
PLATING AND TINNING, &c., OUTFITS.**

Contractors to the British, Colonial, and Foreign  
Governments, Railways and Shipyards.

**POLISHING MACHINERY & MATERIALS  
FOR AERO ENGINE & OTHER PARTS.**



**POLISHING LATHES**, with Self-Oiling and  
Ball Bearings. **EMERY GRINDERS**, **POLISHING  
MOPS**, **POLISHING BOBS**, **POLISHING COM-  
POSITIONS**, "LUSTRE" POLISH.



## THE WHITEHEAD AIRCRAFT CO.'s PROSPECTUS.

The culminating point of all the advertising connected with this company has been now reached by the public issue of the prospectus appealing to the investor for subscriptions.

The following are the main features of the official prospectus:—

1. The purchase consideration which the Company has contracted to pay for the properties has been fixed by Mr. Whitehead at £510,000 (presumably plus mortgages amounting to £42,610 to be redeemed out of the present issue).

2. The Company is under contract to pay to Mr. Whitehead a commission of 12½ per cent. (amounting to £91,900) for procuring subscriptions to this issue.

3. The Company is to pay to cover the preliminary expenses of the issue to Mr. Whitehead £20,000. (This sum does not include underwriting, commissions, and brokerage.)

4. Mr. A. J. Whitehead is appointed Governing Director for life at £3,000 per annum. Six ordinary Directors are to receive £500 each per annum, and there are powers taken to appoint a number of additional directors. The Directors shall also be paid all expenses incurred by them in and about the business of the Company, including their travelling and other expenses incurred in attending the Board meetings of the company.

5. Each share confers the right to one vote.

Such are the main features and conditions of the prospectus which Mr. Whitehead offers to the patriotic British investor. Now, a very cursory examination of the proposal shows that the issue (if successful) will result as follows:—

The prospectus offers 450,000 £1 Ordinary Shares at a premium of 1s. 6d. If fully subscribed, this would give the company .....	£483,750
Also 100,000 1s. Deferred Shares, at a premium of 4s., totalling .....	25,000
Making a total subscription of .....	£508,750
Out of the proceeds of the issue the Company contract to redeem the Second Mortgage Debentures, amounting to .....	300,000
Leaving .....	£208,750
The properties are subject to Mortgages (to be redeemed out of the proceeds of this issue), amounting to .....	42,610
This would leave .....	£166,140
The Company contract to pay Mr. Whitehead 2s. 6d. per share, as per Contract No. 4, which would absorb .....	91,900
Leaving .....	£74,240
The Company contract to pay to Mr. Whitehead, as preliminary expenses .....	20,000

Net amount left to the Company out of the issue ..... £54,240

The Company has further to meet all the expenses of underwriting, brokerages, etc., etc.

The Annual Profit, as shown by the Auditors' Certificate, works out at the rate of £23,066 per annum. It is a safe conjecture to assume that the Directors' fees will be in the future not less than £10,000 per annum. Consequently, the Company rely upon £54,240, which will be further reduced by the unknown expenses of underwriting, brokerage, etc., to make sufficient profit to earn dividends on a capital of one million.

When one considers that to procure £54,240 for working capital, the Company has had to pay Mr. Whitehead £91,900 as commission and £20,000 for expenses, a total of £111,900, one is amazed not only at his effrontery, but that we have officials at the Treasury capable of giving official sanction to such an issue.

The whole of the prospectus bristles with pitfalls for the investor who does not study the prospectus. Take, for instance, the apparently innocent clause "Each share confers the right to one vote," and reflect that the Company's capital is divided into 950,000 shares of £1 each and 1,000,000 shares of 1s. each, and it will be readily seen that the Deferred Shares, amounting to £50,000 controls this one million pound Company. On a level with all the methods and procedure of this company is the fact that although the public are invited to take shares in a Company formed to buy properties for upwards of half a million, no valuation of any kind is furnished. This is typical of the methods of those responsible for the business. Setting aside all question as to the merits of aircraft ventures as suitable mediums for investment such methods of finance must inevitably lead to early disaster in any industry, and every effort must be made by those having the best interests of the industry at heart to warn people off doubtful financial ventures.

The capitalist needs no guidance, it is not necessary to show him the cunningly laid snare, he sees through such methods, but it is the small investor that is the dupe, the man and woman who cannot support such losses, and when one reflects that for

months past Mr. Whitehead has been appealing to the general public, endeavouring to prove to them that it is their patriotic duty to subscribe for his shares it gives one a feeling of nausea.

However, readers of these notes have been warned since the inception of the press campaign last November.

These points of criticism do not cover by any means the questionable elements in the foundation of this Company, but they suffice to show that the shares are not a desirable investment.

G. A.

## AN AIR BOARD CASE.

Before Judge Atherley Jones, at the Central Criminal Court on March 21st the trial was continued of Hugh John Williams, 27, clerk, on bail, charged with attempting to obtain from Mr. Frederick James Newman £303 2s. 6d. as an inducement for doing and forbearing to do certain acts in relation to the affairs of the Air Board. The defendant pleaded "Not Guilty."

Mr. Travers Humphreys, Mr. Cecil Whiteley, and Mr. Settle prosecuted; Mr. H. J. Turrell defended; Mr. Morgan May watched the case for Messrs. Lloyd and Son.

The defendant was appointed a member of the Air Board staff at the Hotel Cecil on January 18th. Before that date he had been employed in another section of the aircraft department. It was his duty to examine tenders for packing cases and make recommendations. Messrs. Lloyd and Son, packing case makers, had tendered for the supply of packing cases and their tender was accepted. The prosecution alleged that the defendant suggested to Mr. Newman, Messrs. Lloyd and Son's confidential clerk, that the firm should add 10s. or 7s. 6d. per case on the tender, which would give an additional profit of £606 5s., and should halve with him that extra profit. Mr. Newman informed the firm of what the defendant had said, and the next day Mr. Lloyd and Mr. Newman communicated with the Air Board authorities.

Mr. Newman, giving evidence, said that when he expressed a doubt as to whether the defendant's suggestion could be carried through, the defendant said, "That's all right. Tenders can be lost or mislaid, and only turn up after the contract has been placed."

Inspector Burton said that at the police court the defendant said he pleaded "Not Guilty," and added, "What I did I did for the good of the Service to detect bribery which I suspected."

The defendant, in evidence said that when the war broke out he was in the Southern States of America, and he at once came to England and joined the Army on September 1st, 1914, as a private. He obtained a commission for meritorious conduct. He was in camp on the South Coast, and it was rumoured that persons were signalling to German submarines off Beachy Head. He asked for special permission to go out, as he knew the Morse Code. On several nights they read the messages, and the messages were sent to the War Office. It was learnt that it was a German code and that the messages were being received by a German submarine at the time when transports were leaving Newhaven. Some days afterwards he captured one of these people, who unfortunately was a British subject. The man was signalling to a German submarine from the top storey of a house at 2 o'clock in the morning with a lamp. He (the defendant) was recommended by his colonel for a commission, which he received.

While serving in France he was recommended for the Military Cross and the D.S.O., and he came home to England badly wounded. He joined the Air Board staff.

In cross-examination by Mr. Travers Humphreys the defendant said he thought there was bribery going on, but he did not mention a word to the authorities because he had no facts. He considered it up to him to obtain the necessary facts. That was what he endeavoured to do, and failed.

Mr. Travers Humphreys: Do you ask the jury to say now that either Mr. Lloyd or the witness Newman are dishonest people?

The Defendant: No, Sir, most emphatically no. They have proved themselves not to be by acting as they did in at once reporting to the Air Board.

The trial was adjourned, the defendant being admitted to bail. The trial was concluded on March 22nd.

The jury found the defendant guilty, but recommended him to mercy on the ground of his age and the excellence of his past career. Judge Atherley Jones sentenced him to six months' imprisonment in the second division.

In summing up, Judge Atherley Jones, after referring to the facts of the case, said there was not the slightest ground for casting the smallest imputation on Mr. Lloyd's commercial morality.

## THE AIRCRAFT BONUS.

It is officially announced that the Committee on Production has approved an arrangement under which plain time workers in federated establishments wholly engaged in the manufacture of aircraft or aircraft parts have received a bonus of 12½ per cent. on earnings.

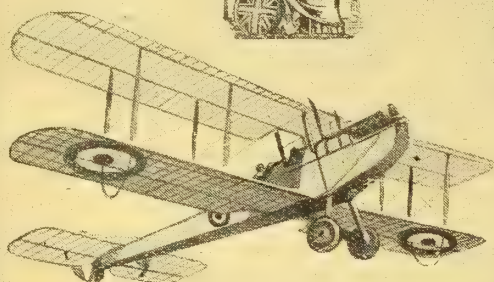


# Britannia Dope

TRADE



MARK



## BritanniaDopes (NON-POISONOUS) and Varnishes

FOR AEROPLANES  
AND SEAPLANES



FOR FULL PARTICULARS APPLY  
TO THE APPROVED MAKERS—

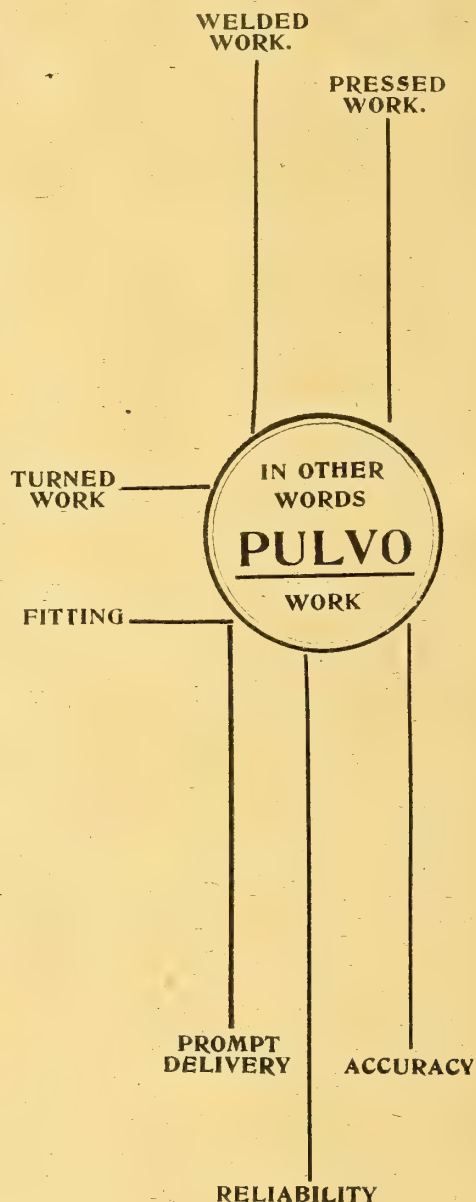
**ROBT. INGHAM  
CLARK & CO. LTD.**

WALTER HOUSE,  
BEDFORD ST., STRAND, W.C.

Telegrams: "Pearline, Westrand."  
Telephone: Regent 3923.

WORKS .. WEST HAM ABBEY, E.15  
Tele phone ... East 955 & 956

# PULVO



**The PULVO ENGINEERING Co. Ltd.**  
10, 12, 14 and 16, DANE STREET, and  
95 and 97, HIGH HOLBORN,  
LONDON, W.C.1.

Telephone :  
Holborn 410.

Telegrams :  
Pulvulpt, West-Cent.



(Continued from page 1156.)

Temp. Lt. F. T. S. MENENDEZ, Gen. List and R.F.C.

For conspicuous gallantry and devotion to duty in carrying out photographic reconnaissances and bombing raids far behind the enemy lines. On one occasion, when attacked by five enemy scouts, he drove three of them down, and the other two then withdrew. On two other occasions he has driven down enemy machines out of control.

Lt. (Temp. Capt.) M. D. G. SCOTT, N. Lanc. R., Spec. Res. and R.F.C.

For conspicuous gallantry and devotion to duty in aerial combats. On one occasion his patrol encountered seven enemy machines, two of which he drove down out of control. He has destroyed eleven enemy aeroplanes, and proved himself a very dashing patrol leader.

Sec. Lt. C. A. STEVENS, W. Rid. R. and R.F.C.

He took part in over 30 successful operations over the enemy's lines, including long-distance photographic reconnaissances and bombing raids. On one occasion he was heavily attacked by enemy aeroplanes. One of which he destroyed, and returned with excellent photographs and with his machine badly shot about. On another occasion, when leading a bombing raid, the formation was heavily attacked by enemy aeroplanes. He skilfully kept the formation together and led it back to the aerodrome. He consistently set a fine example by his skill and determination.

Sec. Lt. R. WINNICOTT, Devon R. and R.F.C.

For conspicuous gallantry and devotion to duty in aerial combats. In a fight against the enemy scouts he drove down two out of control. On another occasion he destroyed an enemy scout, and on three previous occasions drove down enemy machines out of control. His dash and determination were of the highest order.

## CANADIAN FORCE.

Lt. A. G. GOULDING, Infy., and R.F.C.

While escorting a bombing squadron, he attacked and drove down a hostile two-seater machine. He showed great determination and gallantry on many other occasions.

WAR OFFICE, March 19th.

REGULAR FORCES—ESTABLISHMENTS—R.F.C.—MIL. WING.—Ft. Comdrs.—From Flying Officers, and to be temp. Cpts. while so empld.:—Temp. Sec. Lt. A. D. Taylor, Gen. List, Jan. 6th; Temp. Sec. Lt. J. W. Jones, Gen. List, Feb. 21st.

Gen. List.—Temp. Lt. W. W. Gibson, Gen. List, to be temp. Capt. (without pay or allowances of that rank) while specially empld., March 4th.

MEMORANDUM.—Temp. Lt. transfd. to Gen. List:—C. H. Mocatta, R.E., for service with Ind. Army (on prob.), March 20th.

\* \* \*

The King has been pleased to approve of the award of the Military Medal for bravery in the Field to the following Men:—  
14115 1st Cl. Air Mech. W. C. Lindsay, R.F.C. (South Shields).  
5715 1st Cl. Air Mech. F. C. Mills, R.F.C. (Peckham).  
115269 1st Cl. Air Mech. J. Ryder, R.F.C. (Wishaw).  
43691 Sec. Cl. Air Mech. W. G. Worsdall, R.F.C. (Derby).

WAR OFFICE, March 20th.

REGULAR FORCES.—STAFF.—SPECIAL APPOINTMENTS.—(Graded for purposes of pay as a Brig.-Maj. while empld. as 2nd in Comd. of an R.F.C. Officers' Technical Training Wing).—Capt. (actg. Maj.) W. Seaton, M.C., Notts. and Derby R., T.F., from Nov. 1st, 1917, to Jan. 25th.

ESTABLISHMENTS.—R.F.C.—MIL. WING.—Wing Comdr.—Capt. (temp. Maj.) A. A. B. Thomson, M.C., R. War. R., from a Sqdn. Comdr., and to be temp. Lt.-Col. while so empld., Feb. 8th.

Sqdn. Comdrs.—From Ft. Comdrs., and to be temp. Maj. while so empld.:—Sec. Lt. (temp. Capt.) A. D. Bell-Irving, M.C., Gord. Highrs., Spec. Res., Jan. 31st, seny. Oct. 1st, 1917. Capt. C. G. Burge, York and Lanc. R., Feb. 8th. Temp. Capt. P. J. V. Lavarack, M.C., Gen. List, Feb. 23rd.

Special Appts.—(Graded as Sqdn. Comdrs.)—Ft. Comdrs., and to be temp. Maj. while so empld.:—Lt. (temp. Capt.) E. J. L. W. Gilchrist, M.C., Lrs., Spec. Res.; Sec. Lt. (temp. Capt.) C. E. M. Pickhorn, M.C., A.S.C., Spec. Res.; temp. Capt. F. P. Hclliday, D.S.O., M.C., Gen. List, Jan. 8th.

Ft. Comdrs.—From Flying Officers, and to be temp. Cpts. while so empld.—Temp. Lt. G. E. Gibbs, Gen. List, Feb. 20th. Temp. Sec. Lt. G. D. Jooste, Gen. List, March 4th.

Balloon Co. Comdrs.—(Graded as Ft. Comdrs.), from Balloon Comdrs. (graded as Balloon Officers), and to be temp. Cpts. while so empld.:—Lt. P. S. Kershaw, Spec. Res., Jan. 14th. Lt. J. P. Nickalls, R.A., Feb. 6th.

Experimental Officer, 3rd Cl.—(Graded as an Equipment Officer, 3rd Cl.)—Temp. Capt. S. Smith, Gen. List, Jan. 25th.

SCHOOLS OF INSTRN.—WIRELESS SCHOOL.—Asst. Commdt.—(Graded as a Park Comdr.)—Lt. (temp. Capt.) E. Powell, Spec. Res., an Equipt. Officer, 1st Cl., and to be temp. Maj. while so

empld., Jan. 1st (substituted for the notification in the "Gazette" of Feb. 11th).

Gen. List.—To be temp. Sec. Lt.:—Ft. Serjt. G. W. Halstead, from R.F.C., March 1st.

WAR OFFICE, March 21st.

REGULAR FORCES.—N.C.Os. and men to be temp. Sec. Lts., with effect from dates shown:—Infantry (attd.).—Labour Corps.—1st Cl. Air Mech. C. A. J. Wilkie, from R.F.C.

INFANTRY.—Midd'x. R.—Sec. Lt. (temp. Capt., R.F.C.) J. O. Leach, M.C., is placed on the h.p. list on account of ill-health caused by wounds (March 22nd).

WAR OFFICE, March 22nd.

REGULAR FORCES—ESTABLISHMENTS—R.F.C.—MIL. WING.—Staff Officer, 2nd Cl.—(Graded as a Brig. Maj.)—Temp. Lt. (temp. Maj.) A. H. Parker, M.C., Gen. List, from a Balloon Co. Comdr. (graded as a Sqdn. Comdr.), to relinquish the temp. rank of Maj., and to revert to temp. Capt. while so empld. (Feb. 1st). Sqdn. Comdr.—Capt. (temp. Lt.-Col.) R. Loraine, D.S.O., M.C., Spec. Res., to revert from a Wing Comdr., to relinquish his rank of Lt.-Col., and to be temp. Maj. while so empld. (March 3rd, seny. April 24th, 1916).

Ft. Comdrs.—From Flying Officers.—And to be temp. Cpts. while so empld.:—Lt. G. S. M. Insall, V.C., Spec. Res. (Jan. 11th, sen. Aug. 10th, 1917); Temp. Sec. Lt. P. W. S. Bulman, M.C., Gen. List (Feb. 24th); Capt. G. C. Walker, A.S.C., T.F. (Feb. 25th). And to be temp. Cpts. while so empld.:—Temp. Lt. F. C. B. Douglas, Gen. List; Lt. P. D. Baker, R.F.A., T.F.; Sec. Lt. (temp. Lt.) G. J. Scaramanga, N. Staff. R., Spec. Res.; Lt. F. M. Carter, Spec. Res. (Feb. 25th); Lt. A. M. Maclean, Yeo, T.F. (Feb. 28th); Lt. (temp. Capt.) H. A. Fordham, Northd. Fus., from a Staff Officer, 3rd Cl. (graded as a G.S.O., 3rd Gr., at the War Office), and to retain his temp. rank while so empld. (March 3rd, seny. June 14th, 1917).

Equipt. Officers, 1st Cl.—From the 2nd Cl., and to be temp. Cpts., while so empld.:—Lt. E. W. Stubbs, L'pool R., T.F.; (Dec. 11th, 1917); Lt. H. G. Gibbs, Spec. Res. (Feb. 8th); Lt. S. S. Dixon, Spec. Res. (Feb. 20th); temp. Lt. H. McKenna, Gen. List (March 1st).

MEMORANDUM.—Serjt.-Maj. C. Littlejohn, from R.F.C., to be Sec. Lt., whilst serving with R.F.C. (Feb. 19th).

\* \* \*

With reference to the awards conferred as announced in the "London Gazette" dated November 19th, 1917, the following are the statements of services for which the decorations were conferred:—

## THE MILITARY CROSS.

Sec. Lt. (Temp. Capt.) G. L. LLOYD, Yeo., and R.F.C.

Single-handed, he attacked three enemy machines, one of which he brought down out of control. On another occasion he attacked four enemy machines, one of which he brought down in a steep dive. He has brought down many other enemy machines and taken part in numerous combats, displaying magnificent gallantry and skill on all occasions.

## CANADIAN FORCE.

Lt. W. B. FERGUSON, Rail. Troops and R.F.C.

He has continuously done valuable work in locating targets and ranging and observing artillery fire, and was responsible on several occasions for the destruction of hostile batteries by our artillery. He successfully took part in several aerial combats while engaged in this work, and showed great initiative and determination throughout.

WAR OFFICE, March 23rd.

REGULAR FORCES—ESTABLISHMENTS—R.F.C.—MIL. WING.—Adj.-Maj. R. Money, R. Lanc. R., Feb. 8th.

Equipt. Officers, 1st Cl.—Lt. R. G. Cookson, Spec. Res., from a Staff Lt. at the War Office, and to be temp. Capt. while so empld., Feb. 27th.

SCHOOLS OF INSTRN.—SCHOOLS OF MIL. AERONAUTICS.—Instrs.—Graded as Equipt. Officers, 1st Cl.—From Asst. Instrs. (graded as Equipt. Officers, 2nd Cl.), and to be temp. Cpts. while so empld.; Sec. Lt. (temp. Lt.) A. Wombwell, Linc. R., Jan. 1st; Lt. P. C. Routley, Welsh R., T.F., Jan. 15th.

Asst. Instr.—Graded as an Equipt. Officer, 2nd Cl.—Temp. Sec. Lt. (on prob.) A. J. Packham, Gen. List, to be confirmed in his rank and to be temp. Lt. while so empld., Nov. 8th, 1917.

SCHOOL OF TECHNICAL TRAINING.—Park Comdr.—Capt. R. H. C. Routley, R. Fus., from a special appt. (graded as a Staff Capt. while comdg. a Sqdn., R.F.C., Officer Cdt. Wing), and to be temp. Maj. while so empld., Nov. 22nd, 1917).

Gen. List.—Serjt. P. H. Olieff, from R.F.C., to be temp. Sec. Lt. for duty with R.F.C., Jan. 1st.

WAR OFFICE, March 25th.

REGULAR FORCES—ESTABLISHMENTS—R.F.C.—MIL. WING.—Brig. Comdr.—Maj. (temp. Lt.-Col.) C. F. de S. Murphy, D.S.O., M.C., R. Berks. R., from a Wing Comdr., and to be temp. Brig.-Gen. while so empld., March 6th.

Ft. Comdr.—Lt. G. E. H. McElroy, R.A., from a Flying Officer, and to be temp. Capt. whilst so empld. Feb. 16th.



**SCHOOLS OF INSTRN.—SCHOOL OF MIL. AERONAUTICS.**—Chief Instr.—(Graded as a Sqdn. Comdr.)—Lt. (temp. Capt.) G. G. Hubbard, Spec. Res., from an Instr. (graded as an Equipt. Officer, 1st Cl.), and to be temp. Maj. whilst so empd., Jan. 2nd.

Instr.—(Graded as an Equipt. Officer, 1st Cl.)—Lt. (temp. Capt.) F. R. Hardie, Hrs., from an Asst. Instr. (graded as an Equipt. Officer, 2nd Cl.), Jan. 2nd.

Asst. Instr.—(Graded as an Equipt. Officer, 2nd Cl.)—Temp. Lt. A. E. Turner, M.C., Gen. List, a Flying Officer (Observer), Jan. 2nd.

#### AIR MINISTRY, March 22nd.

The following Officers are attached to the Royal Air Force, and are granted temporary commissions in that Force in the ranks stated below:—

#### AIR COUNCIL.—Jan. 3rd.

Sir David Henderson, K.C.B., D.S.O. (Lt.-Gen. in Army), to be Lt.-Gen.

Sir H. M. Trenchard, K.C.B., D.S.O. (Maj.-Gen. in Army), to be Maj.-Gen.

M. E. F. Kerr, C.B., M.V.O. (Rear-Admiral, Royal Navy), to be Maj.-Gen.)

Sir G. M. Paine, K.C.B., M.V.O. (Commedore, Royal Navy), to be Maj.-Gen.

W. S. Brancker (Bt. Col. in Army) to be Maj.-Gen.

#### AIR MINISTRY.—Feb. 18th.

A. V. Vyvyan, D.S.O. (Capt., R.N.), to be Col. and to be temp. Brig.-Gen. while a Director.

H. D. Briggs (Capt., R.N.), to be Lt.-Col., and to be temp. Brig.-Gen. while a Director.

W. W. Warner (Bt. Lt.-Col., Indian Army, ret'd.), to be Lt.-Col., and to be temp. Brig.-Gen. while a Director.

B. C. H. Drew (Bt. Lt.-Col., Indian Army), to be Lt.-Col., and to be temp. Brig.-Gen. while a Director.

R. C. Munday (Fleet Surgeon, Royal Navy), to be Maj.-Gen. (March 5th, 1918).

The following Officers are transferred to the Royal Air Force and granted temporary commissions in that Force in the ranks stated below:—

#### February 18th.

F. C. Jenkins (Bt. Maj. in Army, Spec. Res.) to be Lt.-Col., and to be temp. Brig.-Gen. while a Director.

A. Huggins, D.S.O. (Capt. in Army, Spec. Res.), to be Lt.-Col., and to be temp. Brig.-Gen. while so empd. as a Director.

C. H. Whittington, C.M.G. (Capt. in Army, Spec. Res.), to be Lt.-Col., and to be temp. Brig.-Gen. while a Director.

A. Fletcher, M.C. (Qrmr. and Hon. Capt. in Army), to be Lt.-Col., and to be temp. Brig.-Gen. while a Director.

### FROM THE COURT CIRCULAR.

#### BUCKINGHAM PALACE, March 20th.

The Queen, accompanied by the Prince of Wales and the Prince Henry, and attended by the Lady Mary Trefusis and the Earl of Cremer, visited the Works of Messrs. Gwynnes, Limited, and was received by Mr. N. Gwynne (Managing Director), Mr. J. Dewar (Director), and the Staff.

Major I. B. Davson, Department of Aeronautical Supplies, was also in attendance.

#### BUCKINGHAM PALACE, March 23rd.

The following had the honour of being received by His Majesty, when The King invested them with the Insignia of the Order into which they have been admitted:—

#### THE DISTINGUISHED SERVICE ORDER.

Wing-Comdr. Frederick Bowhill, R.N.

Sqdn.-Comdr. Edwin Moon, R.N.A.S.

\* \* \*

His Majesty then conferred decorations as follows:—

**TWO BARS TO THE DISTINGUISHED SERVICE CROSS.**  
Flt.-Comdr. James Struthers, R.N.A.S.

**THE DISTINGUISHED SERVICE CROSS AND TWO BARS**  
Flt.-Comdr. Robert Compston, R.N.A.S.

**THE DISTINGUISHED SERVICE CROSS AND BAR.**  
Flt.-Lt. William Jordan, R.N.A.S.

**THE DISTINGUISHED SERVICE CROSS.**  
Flt.-Comdr. Richard Munday, R.N.A.S.

Flt. Sub-Lt. Edward Johnstone, R.N.A.S.

#### THE MILITARY CROSS.

Capt. Ronald Ayre, R.F.C.

Capt. Edric Broadberry, R.F.C.

Capt. Frank Fernihough, R.F.A. and R.F.C.

Lt. Henry Hammond, Dorset Regt., attd R.F.C.

#### MARLBOROUGH HOUSE, March 25th.

Queen Alexandra, accompanied by the Princess Victoria, visited the Handley Page Factory and Aerodrome this afternoon.

Her Majesty was received on arrival by Messrs. F. and T.

Handley Page (Directors) and Maj. Davson (Ministry of Munitions).

The Hon. Charlotte Knollys, the Hon. Violet Vivian, and Col. Sir Arthur Davidson were in attendance upon Her Majesty.

### NAVAL.

#### ADMIRALTY COMMUNIQUÉS.

**MARCH 20th.**—On March 19th, a British seaplane patrol flying in the Heligoland Bight encountered two enemy seaplanes 10 miles to the north-eastward of Borkum.

The enemy was engaged, and one of his machines driven down in flames.

Our machines returned safely.

**MARCH 21st.**—British seaplanes engaged in reconnaissance in the Heligoland Bight attacked enemy mine-sweepers with machine-gun fire.

No casualties on the British side.

All machines returned safely.

Ostend was bombarded this afternoon by British monitors with successful results.

Prior to the bombardment four enemy aircraft were destroyed by a naval air squadron. Enemy aircraft attacked British machines while spotting for bombardment, with the result that another enemy machine was destroyed.

**MARCH 25th.**—During offensive patrols carried out by Royal Naval Air Service machines from Dunkirk from March 21st to 24th ten enemy machines were destroyed and seven shot down out of control. A hostile balloon was also brought down in flames.

Three bombing raids were carried out on Bruges Dock, and many direct hits were obtained on sheds on the quays. Bombs were also seen to burst close to enemy destroyers. Several hostile torpedo-boats and a destroyer and an armed trawler were attacked.

One of our aeroplanes was forced to land in the sea, the pilot being picked up by a French destroyer. With this exception all our machines returned safely from these operations.

\* \* \*

The following is an extract from the official account of the destroyer action off Dunkirk in the early morning of March 21st:—

The adventures of the remaining 15 German destroyers were by no means ended when they quitted French waters, leaving three of their number behind. A squadron of the Royal Naval Air Service bombing machines proceeding up the coast sighted the bombing German flotillas and fell on them—or rather suffered their bombs to do so. They reported having completely thrown the enemy into disorder and scattered them in all directions. A squadron of enemy seaplanes that had gone out at dawn to look for the wanderers then encountered the escort fighters of the bombing machines, and in a very short time had their numbers reduced by four. Of these, three were accounted for by one British pilot.

#### THE CASUALTY LIST.

Reported March 20th.

**ACCIDENTALLY KILLED.**—Emmett, Flt. Sub-Lt. C. W., R.N.

Goodwin, Flt. Sub-Lt. G. J. W., R.N.

**DIED.**—Turner, Prob. Flt. Officer W. H., R.N.

**ACCIDENTALLY INJURED.**—Anderson, Flt. Sub-Lt. W. S., R.N.

Walker, Prob. Flt. Officer C. F., R.N.

Kelly, Prob. Flt. Officer W. J., R.N.

Carlin, Prob. Flt. Officer F. R., R.N.

**PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.**—Eyre.

Flt. Sub-Lt. E. G. A., R.N.

Reported March 22nd.

**ACCIDENTALLY KILLED.**—Cole, A. S., Aircraftman, 2nd Cl. F43316.

**MISSING.**—Capp, P. J., Act. Air Mech., 1st Gr., F7029.

Reported March 23rd.

**ACCIDENTALLY KILLED.**—Harland, Prob. Flt. Officer E. W., R.N.

**DROWNED.**—Greenwood, Flt. Sub-Lt. C. T., R.N.

Macdonald, Flt. Sub-Lt. C. G., R.N.

**DIED.**—Hassett, Mr. A. C., W.O. R.N.A.S.

**MISSING.**—Minifie, Actg. Flt. Comdr. R. P., D.S.C., R.N.

Allison, Flt. Sub-Lt. J. L., R.N.

Ransford, Flt. Sub-Lt. L. B., R.N.

Steeves, Flt. Sub-Lt. G. T., R.N.

**WOUNDED.**—Wodehouse, Flt. Sub-Lt. C. E., R.N.

**SLIGHTLY WOUNDED.**—Cartmel, Flt. Sub-Lt. G. M., R.N.

**ACCIDENTALLY INJURED.**—Matthews, Prob. Flt. Officer A. H. R.N.

Sherlock, Prob. Flt. Officer C. E., R.N.

Lawler, Prob. Flt. Officer F. N., R.N.

Reported March 25th.

**PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.**—Winter,

Act. Flt. Comdr. R. R., R.N.

**ACCIDENTALLY KILLED.**—Arnold, Flt. Lt. H. J., D.S.O., R.N.

Brown, Prob. Flt. Officer, L., R.N.

Franklin, Prob. Flt. Officer C. C., R.N.

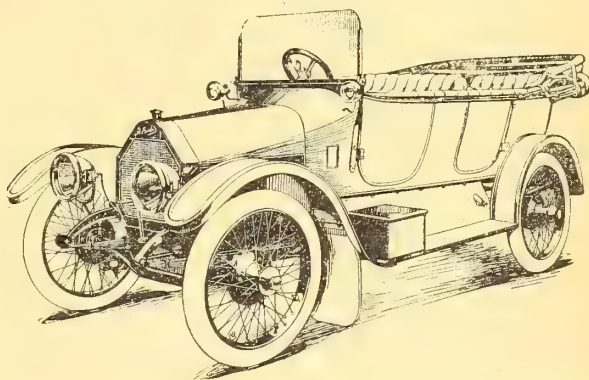


# Humber

Motorists in all parts of the British Empire are ready to endorse the claims of Humber Cars for reliability, durability and refinement of detail. The reason why many others are compelled to wait for new cars is because our whole resources are requisitioned for war work.

*Are you on the Waiting List?*

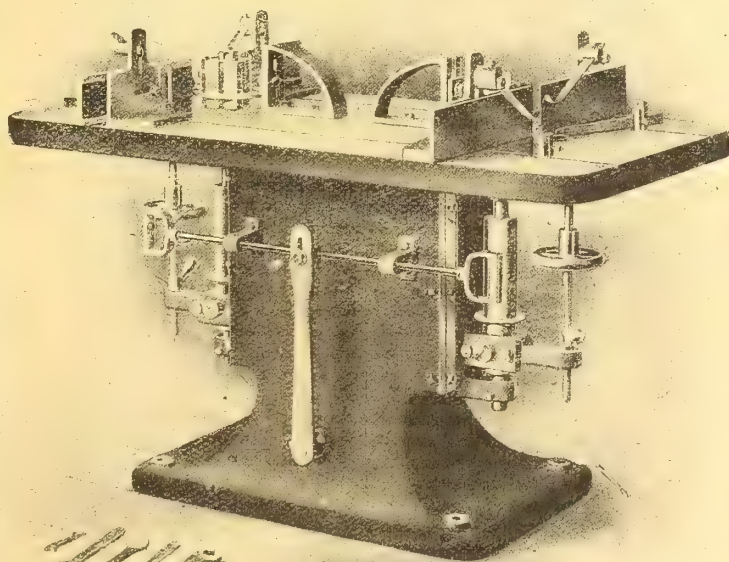
HUMBER LIMITED  
COVENTRY



# HAIGHS

(OLDHAM) LIMITED

MANUFACTURERS OF ALL KINDS OF WOODWORKING MACHINERY.



## D.D. Double-Spindle Circular Moulding Machine

Suitable for many varieties of irregular and circular work required in a Cabinet Maker's, Joiner's, or Builder's Works.

Globe Iron Works,  
OLDHAM.

Telegrams: HAIGH, OLDHAM.  
Telephone: 1273 Oldham.



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



**MISSING.**—Ormerod, Flt. Comdr. L. W., D.S.C., R.N.  
 Pattisson, Obsr. Sub-Lt. W. L. H., D.S.C., R.N.  
**ACCIDENTALLY INJURED.**—Allen, Prob. Flt. Officer, W. J., R.N.  
 Smith, Prob. Flt. Officer, C. B., R.N.

### PERSONAL NOTICES.

#### DEATHS.

**ARNOLD.**—Flt. Lt. Harwood J. Arnold, D.S.O., R.N., of Rides House, Warden, Isle of Sheppey, was accidentally killed whilst flying on March 20th. He was 28 years of age.

**BROWN.**—An inquest was held at Eastbourne on March 22nd on the body of Prob. Flt. Officer Lewis Brown, R.N., aged 19. He was seated in a biplane preparing to rise when another machine landed on him, and he was killed instantaneously. A verdict of "Accidental death" was returned.

**EMMETT.**—Flt. Sub-Lt. Cyril William Emmett, R.N. (accidentally killed on active service on March 15th) was the younger son of Mr. Richard Emmett and Mrs. Emmett, of Winton, Portsmouth. He was nineteen years of age, and was educated at Lynam's Preparatory School, Oxford, and Repton. He joined the R.N.A.S. in May, 1917.

**MAITLAND.**—Sub-Lt. Henry Jervois Ruault Maitland, R.N.V.R., died of pneumonia following upon scarlet fever at Halifax, Nova Scotia, on March 17th. He was the younger son of the late Edward J. Maitland and Mrs. Maitland, of Banstead Hall, Surrey, and was aged 19. Educated at Banstead Hall and Harrow, he joined the R.N.A.S. in April, 1916, but owing to an accident while flying he was forced to leave the Air Service, and was appointed to the Naval Control at Halifax. He went to Canada in Feb., 1917.

#### MARRIAGE.

**BORE—ALLEN.**—On March 21st, at Putney Presbyterian Church, John William Bore, R.N.A.S., elder son of Mrs. Bore and the late Mr. John Bore, Liverpool, was married to Margaret Benson (Daisy), only child of Mr. F. C. Allen, J.P., Putney, by the Rev. J. Cochrane, M.A.

#### BIRTH.

**MAYCOCK.**—On the 19th inst., at the Maternity Nursery Home, Nelson Road, Southsea, the wife of Flt. Comdr. R. B. Maycock, R.N.A.S., of a son.

\* \* \*

The King has been pleased, on the recommendation of the President of the Board of Trade, to award the Silver Medal for Gallantry in Saving Life at Sea to Flt. Sub-Lt. (now Flt. Lt.) James Lindsay Gordon, R.N., Flt. Sub-Lt. (now Flt. Lt.) George Ritchie Hodgson, R.N., Leading Mechanic (E) Sydney Francis Anderson, and Wireless Telegraphist (A.M. II.) Bertram Harley Millichamp in recognition of their services in rescuing two men from an upturned float in the North Sea on May 29th last.

### MILITARY.

#### G.H.Q. COMMUNIQUÉS.

**MARCH 19th, 9.30 p.m.**—On the 18th inst. the atmosphere was again clear and favoured the co-operation of the aeroplanes and artillery. Several long-distance reconnaissances were successfully completed and many photographs were taken by us.

Nine tons of bombs were dropped on the enemy's rest billets and ammunition dumps, and also on Busigny railway station and two hostile aerodromes. One of these latter is occupied by large hostile bombing machines.

Fighting in the air was exceedingly intense, encounters taking place between large formations of our own and the enemy's machines. Nineteen German aeroplanes were brought down and nine driven down out of control.

Twelve of our machines are missing.

Our bombing machines attacked military objectives at Mannheim, on the Rhine. Over a ton of bombs were dropped with excellent results.

Eight direct hits were obtained on the Badische soda factory, causing an abnormally large column of black and white smoke to ascend. Also two bursts were seen on the docks and one on another large factory.

Our aeroplanes were attacked by two formations of enemy machines. As a result of the fighting two German aeroplanes were driven down out of control over Mannheim, and the remainder of the hostile machines were driven off.

All our machines returned safely.

During the night a further 600 bombs were dropped by us on two aerodromes used by the enemy's night-flying machines and on ammunition depôts and billets.

All our machines returned.

**MARCH 21st, 9.50 p.m.**—On the 20th instant rain and clouds almost entirely prevented flying. After dark, when the weather cleared, our night-flying squadrons dropped 300 bombs on a hostile aerodrome, south-west of Tournai, used by the enemy's night-flying machines, and also on a large ammunition depot north-east of St. Quentin.

All our machines returned.

**MARCH 22nd, 11.28 p.m.**—On the morning of the 21st inst. mist hung over the whole front. It cleared locally later in the day, but in most places the light was only suitable for low flying.

The enemy's attacking troops and reinforcements on the battle front offered most excellent targets to the pilots of our low-flying machines, who poured many thousands of rounds into them, causing innumerable casualties. Our bombing machines also attacked these targets, in addition to bombing important railway stations on the battle front, a total of over 900 bombs being dropped by them.

A great deal of fighting took place at a low altitude, in which 16 hostile machines were brought down and six were driven out of control. A hostile balloon was destroyed by one of our pilots, and one of the enemy's low-flying aeroplanes was shot down in our lines by our infantry.

Three of our machines are missing.

During the night our night-flying squadrons in the southern area of the front were unable to leave the ground owing to the mist.

In the northern area, where the weather was clear, our aeroplanes dropped three and a half tons of bombs on the dockyards at Bruges and three and a half tons on rest billets north-west of Tournai.

All our machines returned.

**MARCH 23rd, 9.57 p.m.**—On the 22nd inst. thick morning mist prevented our aeroplanes from leaving the ground during the early part of the day. When the mist cleared activity in the air on the battle front became very great.

The enemy's low-flying machines were particularly active, engaging our forward troops with their machine-guns.

The enemy's massed troops again offered good targets to our own low-flying aeroplanes. The location of large bodies of hostile troops and transport were reported by our machines to our artillery and successfully engaged.

Eight and a half tons of bombs were dropped on hostile railway stations in rear of the battle front and also on the enemy's billets, high-velocity guns, troops, and transport.

Fighting in the air was very heavy indeed, almost all the combats taking place between Arras and St. Quentin.

Twenty-seven enemy machines were brought down and 20 were driven down out of control. Two hostile machines were also shot down in our lines by anti-aircraft gunfire, and another by our infantry.

Eight of our machines are missing.

During the night our squadrons dropped over 14 tons of bombs on hostile billets and ammunition dumps, and upon the areas in which the enemy's attacking troops were concentrated.

All our machines returned.

**MARCH 24th, 10.15 p.m.**—On the 23rd inst. the weather again favoured operations in the air. Our aeroplanes were constantly employed in reconnoitring the position of troops, in photography and bombing, and in reporting suitable targets to our artillery.

Many thousands of rounds were fired by our pilots from a low height on hostile troops massed in villages and in the open.

Bombing was carried on continuously throughout the day. Over 14 tons of bombs were dropped on the enemy's billets, on his high velocity guns, and on railway stations in the battle area.

The enemy's low-flying aeroplanes were most persistent in their attacks on our infantry in forward areas. Many of these machines were attacked and brought down by our pilots.

A total of 29 hostile machines were brought down, and 25 others were driven down out of control. Two of the enemy's balloons also were destroyed.

Nine of our machines are missing.

From nightfall until early morning our night-flying squadrons bombed the areas on the battle front in which hostile troops were concentrated as well as the enemy's ammunition dumps and large guns.

Over 14 tons of bombs were again dropped by our machines, 2½ tons of which were dropped on the docks at Bruges.

All our machines returned.

During the same night 10 heavy bombs were dropped on the important railway bridge and works at Kunz (just south of Trèves in Germany). Eight of these bombs were clearly seen to burst among the railway works.

Nearly two tons of bombs were dropped from low heights on a hostile aerodrome south of Metz. Six bombs were seen to burst among the hangars and set fire to some huts on the aerodrome.

All our machines returned.

On the 24th inst. our machines carried out another most successful raid on the factories at Mannheim. Nearly 1½ tons of bombs were dropped, and bursts were seen on the soda factory and railway, and on the docks. Several fires were started, one of which was of great size, with flames reaching to a height of 200 feet, and smoke to 5,000 feet. The conflagration was visible from a distance of 35 miles.





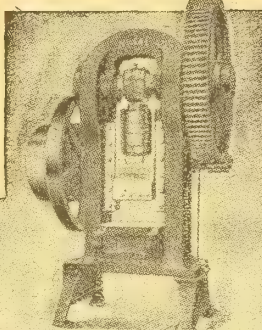
**BLISS**

**PRESSES & DIES**

FOR

**AEROPLANE**

SEND YOUR  
STAMPING  
PROPOSITIONS  
TO US.



**STAMPINGS**

WE CAN DESIGN  
THE DIES  
AND RECOMMEND  
SUITABLE PRESSES.

WRITE TO  
**E. W. BLISS CO.,**  
2a POCKOCK STREET, BLACKFRIARS RD., LONDON, S.E.1  
TELEPHONE: HOP 4340      TELEGRAMS: "BLISSDON, LONDON."



HEIGHT MEASURING  
**ANEROID ALTIMETERS**

(Illustration is Half Actual Size.)

:: FOR EVERY TYPE OF ::

**AIRCRAFT**

**"S. & M." INCIDENCE GAUGE**

FOR MEASURING ANGLES.  
— TO CLOSE LIMITS. —

(Illustration is Half Actual Size.)



Manufactured by

**SHORT & MASON, Ltd.,**

ANEROID WORKS, WALTHAMSTOW, LONDON, E.17.

Telegrams: "ANEROID, PHONE, LONDON."

Telephone: WALTHAMSTOW 180.



Our bombing aeroplanes were attacked by 32 hostile machines and a fierce fight ensued. One of the enemy's aeroplanes was brought down in flames and another was brought down and fell in the centre of Mannheim. Five others were driven down out of control.

In spite of this severe combat and the enemy's heavy anti-aircraft gunfire, all our machines have returned except two.

MARCH 25th, 10.50 p.m.—On the 24th inst. activity in the air was very great.

The day was remarkable for the weight of bombs dropped by our aeroplanes, the number of flights that took place, and the many thousands of rounds fired by our pilots from low altitudes upon the enemy's troops.

The progress of the battle was reported by our aeroplanes, and our artillery were informed of suitable targets. Masses of hostile troops concentrated in the battle area were caught by our low-flying machines both with bombs and machine-gun fire.

Over 1,700 bombs were dropped during the day on different targets, which included Bruges Docks, Aulnoye railway station, a large camp south-east of Cambrai, high-velocity guns, and hostile reinforcements.

The fighting was the most severe so far experienced. Our aeroplanes brought down 45 of the enemy's machines and drove down 22 out of control. Two other hostile machines were shot down by our anti-aircraft guns.

Ten of our machines are missing.

After dark our bombing aeroplanes again concentrated their efforts upon bombing and attacking with machine-gun fire the enemy's troops opposite the battle front.

Bruges Docks and an aerodrome midway between Tournai and Mons used by hostile night-flying machines were also bombed. Over 14 tons of bombs were dropped.

All our machines returned.

During the night one of the enemy's large bombing machines landed behind our lines.

Following on the successful daylight raid on Mannheim, other objectives in Germany were attacked during the night. Half a ton of bombs were dropped by us on the railway stations at Cologne, where a fire was started.

Over a ton was distributed between Luxemburg railway station, where a fire was started, and Courcelles railway station (east of Metz).

Two tons of bombs were dropped on Metz railway station. Direct hits were obtained on a bridge south-east of the town and on a stationary train, which was set on fire. A large fire was started on this occasion also.

Other machines dropped a ton of bombs on Thionville railway station, where a moving train was derailed and a fire caused.

All our machines returned.

#### WAR OFFICE COMMUNIQUÉS.

MARCH 20th.—The G.O.C. Macedonia reports:—

Our aeroplanes have bombed Angista and Porna stations (east of the Struma). Near the latter place a train was attacked by machine-gun fire from a low altitude. The driver was seen to jump off, and the train was derailed and subsequently bombed. Another aeroplane directed machine-gun fire from a height of 300 ft. against a Bulgarian company in Seres.

A hostile machine was shot down and fell into Lake Doiran.

The Ind'a Office made the following announcement on March 20th:—

The attitude of the Marris, in Baluchistan, which has been unsatisfactory for some time, has recently culminated in a series of outrages.

Our aeroplanes have on two occasions recently bombed their tribal concentrations with effect.

MARCH 21st.—The G.O.C. Palestine reports:—

On the latter date an effective bombing raid was executed by units of the Royal Flying Corps and Australian Flying Corps against the enemy establishments in the vicinity of El Kutrani Station (on the Hedjaz Railway, 35 miles east of the southern end of the Dead Sea). Four hundred and seventy bombs were dropped on the station buildings and on railway trains, direct hits being observed on the objectives.

One enemy aeroplane was destroyed in aerial fighting, and two of our machines failed to return.

MARCH 23rd.—The G.O.C. Italy reports:—

Little infantry activity since my last report. Much successful counter-battery work has been carried out.

Our aircraft have fully maintained their superiority in the air, and have destroyed eight enemy machines and brought one down out of control, without loss to themselves.

MARCH 25th.—The G.O.C. Palestine reports:—

During the night of March 23rd fresh bridges were thrown across the Jordan, and by the evening of the 24th our troops had progressed nine miles through difficult mountainous country in the direction of Es Salt.

An enemy formation of five aeroplanes was attacked by one of our patrolling machines, which shot down three out of control.

Very effective bombing and machine-gun operations were carried out by R.F.C. and Australian Flying Corps units, many direct hits being obtained on the enemy's troops, transport and camps, whilst trains on the Hedjaz Railway were attacked successfully.

#### PRESS BUREAU COMMUNIQUÉS.

The Secretary of War Office announced on March 25th in a supplementary communiqué concerning the Western front:—

Heavy losses have been inflicted on the enemy by our artillery and machine-guns, whilst our low-flying aeroplanes have repeatedly attacked the enemy's advancing columns farther to the rear.

#### THE CASUALTY LIST.

Reported March 20th.

KILLED.—Collins, Sec. Lt. R. S., R.F.C.  
Green, Sec. Lt. G. W. A., R.F.A., attd. R.F.C.  
Moore, Sec. Lt. R., R.F.C.  
Stevens, Sec. Lt. D. A. S., R.F.C.  
Yell, Sec. Lt. R. H., R.F.C.  
WOUNDED.—Kingham, Lt. E. C., Bord. R., attd. R.F.C.  
Luyt, Sec. Lt. H. V. C., R.F.C.  
McGovern, Sec. Lt. T., R.F.C.  
Mayoss, Sec. Lt. W. F., R.F.C.  
Pilcher, Lt. C. R., R.E., attd. R.F.C.  
Tate, Sec. Lt. R. M., R.F.C.  
MISSING.—Foster, Lt. P. La T., R.F.C.  
McNeil, Sec. Lt. F. G., R.F.C.  
Perkins, Sec. Lt. J. F. R. L., R.F.C.  
Tilney, Maj. L. A., M.C., R.F.C. (Sec. Lt., Household Cav.)  
Topliss, Sec. Lt. R. H., R.F.C.  
CANADIAN FORCES.—KILLED.—Heney, Lt. J. B. L., M.C., F.A., attd. R.F.C.  
ACCIDENTALLY KILLED.—Murphy, Capt. V. P., N.S. Regt., attd. R.F.C.  
MISSING.—Foley, Lt. R. G., M.C., E. Ont. Regt. attd. R.F.C.  
PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER IN GERMAN HANDS.—Shaw, Lt. G. M., Cent. Ont. Regt., attd. R.F.C.

Reported March 21st.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—  
Messervy, Capt. E. D., Lond. R., attd. R.F.C.  
DIED OF WOUNDS.—Tipton, Capt. R. J., R.F.A., attd. R.F.C.  
WOUNDED.—Carroll, Lt. J. M., Durh. L.I., attd. R.F.C.  
Gilham, Sec. Lt. G., R.F.C.  
Trotter, Sec. Lt. F. A., R.F.C.  
MISSING.—Caldecott, Sec. Lt. R., R.F.C.  
Edmonds, Sec. Lt. E. P. P., R.F.C.  
Ffolliott, Lt. C. R. H., R.F.C.  
Flère, Sec. Lt. C. H., R.F.C.  
McKim, Sec. Lt. J. N. B., R.F.C.  
Thomas, Sec. Lt. G. P. F., Durh. L.I., attd. R.F.C.

Reported March 22nd.

KILLED.—Ikin, Sec. Lt. A. E., R.F.C.  
Woodman, Sec. Lt. D., R.F.C.  
DIED OF WOUNDS.—Robertson, Lt. J. H., R.F.C.  
Tyson, Maj. E. J., D.S.O., M.C., R.F.C.  
WOUNDED.—Bell, Sec. Lt. J. W., R.F.C.  
Bidmead, Sec. Lt. B., Sher. For., attd. R.F.C.  
Burt, Sec. Lt. P. H., R.F.C.  
Cleland, Sec. Lt. E. McL., R.F.C.  
Johnson, Sec. Lt. T. L., R.F.C.  
Learnmount, Maj. L. W., D.S.O., M.C., R.F.C.  
Taylor, Sec. Lt. E. T., R.F.A., attd. R.F.C.  
MISSING.—Haynes, Lt. J. L. P., L.N. Lanc. R., attd. R.F.C.  
INDIAN FORCES.—WOUNDED.—Craik, Lt. D., I.A.R.O., attd. R.F.C.  
DIED AS PRISONER IN TURKISH HANDS.—Corbett, Maj. R. D. de la C., I.A. Inf., attd. R.F.C.

Reported March 23rd.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—  
Tomkies, Sec. Lt. H. L., Sher. For., attd. R.F.C.  
WOUNDED.—Brewer, Capt. C. H., Bedf. R., attd. R.F.C.  
Broadhurst, Sec. Lt. D. S., R.F.C.  
Humphrey, Sec. Lt. E. G., S. Staff. R., attd. R.F.C.  
MacDougall, Sec. Lt. P. A., R.F.C.  
MISSING.—Clutterbuck, Sec. Lt. L. C. F., R.F.C.  
Falkenberg, Sec. Lt. G. D., R.F.C.  
Fenton, Sec. Lt. C. B., R.F.C.  
Ferguson, Lt. J. A. A., R.F.C.  
Fitzmaurice, Sec. Lt. A. H., R.F.C.  
Gill, Lt. H. G., W. Yorks. R., attd. R.F.C.  
Kennedy, Capt. D. S., R.F.C.  
Muir, Sec. Lt. J. W., R.F.C.  
PREVIOUSLY REPORTED PRISONER, NOW REPORTED BY GERMAN GOVERNMENT KILLED OR DIED OF WOUNDS.—Beattie, Lt. J. O., B.C.R., attd. R.F.C.  
WOUNDED.—Cooke, Lt. B. A., Alta. R., attd. R.F.C.

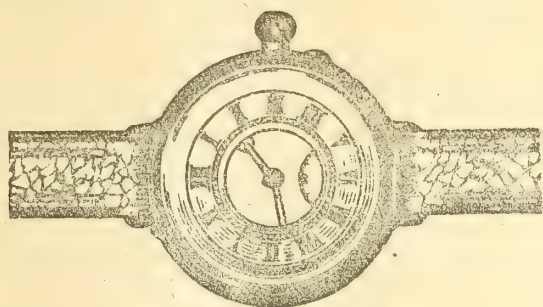


JEWELLERS



SILVERSMITHS

BY APPOINTMENT



Patent No. 11876/16.

## THE "MILITARY" LUMINOUS WATCH.

A THOROUGHLY reliable and practical luminous watch, indispensable for Naval or Military Service. The "Military" Luminous Watch is the only Screw Case Silver Watch fitted with a "hunter" cover, and is the exclusive patent of The Goldsmiths and Silversmiths Company, Ltd.

As Illustrated.

£4 12 6

Without Cover.

£3 15 0

THE  
**GOLDSMITHS & SILVERSMITHS  
COMPANY LTD.** with which is incorporated The Goldsmiths' Alliance Ltd. Established 1831.

Only one Address (no branches):

112, REGENT STREET, LONDON, W

# THE TIELOCKEN

Naval or  
Military  
Catalogue  
Post Free.



## Burberry Weatherproof

ensures that the most vulnerable parts of the body are doubly covered, and combines with workmanlike design such effective weather-resistance that wet and cold can be faced with an assurance of immunity from discomfort.

Unlike coats, loaded with oiled-silk or rubber, whilst efficiently protective, it is self-ventilating, and free from all unhealthy heat.

To make security doubly sure, it is lined with Proofed Cloth or soft Camel Fleece, which, in addition to increasing its defensive powers, makes it the warmest and most comfortable coat available for air-work.

A strap and buckle holds THE TIELOCKEN securely—no buttons to fasten or catch in wires.

**Complete R.F.C. and  
R.N.A.S. Kits in 2 to 4  
Days or Ready for Use.**

### THE TIELOCKEN

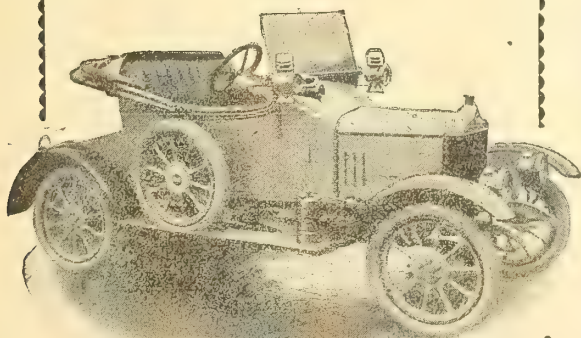
The collar can be worn (1) open, as illustrated; (2) closed to the throat; or (3) turned-up, when it forms a close-fitting storm collar that prevents any possibility of wet trickling down the neck.

Every Burberry Garment  
is labelled "Burberrys."

**BURBERRYS Haymarket LONDON S.W. 1.**  
8 & 10 Bd. Malesherbes PARIS; also Provincial Agents

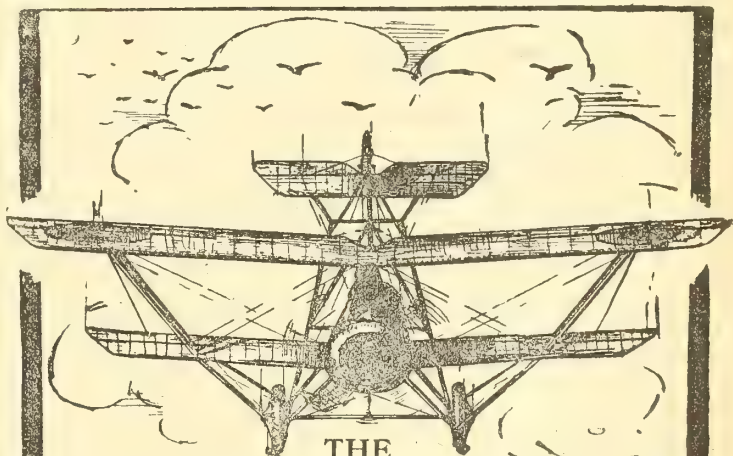
**Economy in Motoring**  
is represented by just how far your requirements are met by the type of machine you purchase. Study for yourself the advantages offered in the  
**'STANDARD'**

Light Car and bear these in mind when we are able to resume deliveries. :: ::



**THE STANDARD MOTOR CO LTD  
COVENTRY**

London Agents The Bitchley Autocar Co Ltd 216 Gr Portland St W



## THE CAMBRIDGE SCHOOL OF FLYING

30b, St. Andrews Street, Cambridge.

Write for particulars of Courses in

- (1) **FLYING** for R.Ae.C. Pilot's Certificate. Individual attention, best aeroplanes, large machine/pupil ratio. Immediate vacancies.
- (2) **Aero-Engineering by CORRESPONDENCE**, including Aeroplanes, Airships, Engines, Stress Calculation, etc.; Draughtsmanship, Design, Experimental Data, etc.

**CHARGES MODERATE. INSTRUCTION THOROUGH.**



Reported March 25th.

KILLED.—Batt, Lt. F. J., R.F.C.  
 Browning, Sec. Lt. G. H., E. Lanc. R.  
 Faithful, Capt. E. B. F., Conn. R., attd. R. Ir. Regt.  
 Kynoch, Sec. Lt. A. S., R.F.C.  
 McNiff, Sec. Lt. F. J., Northd. Fus., attd. R.F.C.  
 Stevens, Lt. D. E., Manch. R., attd. R.F.C.  
 DIED OF WOUNDS.—Milligan, Sec. Lt. F. J., R.F.C.  
 ACCIDENTALLY KILLED.—Hamilton, Sec. Lt. J. P., R.F.C.  
 WOUNDED.—Allan, Sec. Lt. T., R.F.C.  
 Bunting, Sec. Lt. S. W., R.F.C.  
 Dickson, Sec. Lt. T. B., R.F.C.  
 French, Lt. T. H., R.F.C.  
 Oades, Sec. Lt. S. A., R.F.C.  
 MISSING.—Allen, Sec. Lt. C., R.F.C.  
 Crammond, Lt. G. R., Lanc. Fus., attd. R.F.C.  
 Watson, Lt. N. T., Middx. R., attd. R.F.C.  
 Millett, Sec. Lt. J. N. L., R.F.C.  
 Wells, Sec. Lt. N. B., R.F.C.  
 Whitehead, Sec. Lt. E. A., R.F.C.  
 PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER IN  
 GERMAN HANDS.—Manley, Sec. Lt. G. A. C., R.F.C.  
 AUSTRALIAN FORCE.  
 PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER IN  
 GERMAN HANDS.—Randell, Lt. W. B., Fl. Corps.  
 Reported March 26th.  
 KILLED.—Adams, Sec. Lt. B. K., R.F.C.  
 Hartley, Sec. Lt. H. H., R.F.C.  
 PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED.—  
 New, Lt. H. B., Essex R., attd. R.F.C.  
 Roadley, Lt. T. S., N. Staff. R., attd. R.F.C.  
 DIED OF WOUNDS.—McConnell, Sec. Lt. F. J., R.F.C.  
 MISSING.—Brookes, Sec. Lt. R. B., R.F.C.  
 Cann, Sec. Lt. L., R.F.C.  
 Gavaghan, Sec. Lt. C., R.F.C.  
 Wilson, Sec. Lt. T. S., R.F.C.

#### CASUALTIES AMONG N.C.O.s. AND MEN. THE DATES ARE THOSE OF THE OFFICIAL LIST.

## KILLED.

MARCH 12th, R.F.C.—Nelson 27066 1st Cl. Air Mech. J. (Falkirk).  
 MARCH 16th.—Hardeman 4411 Serjt. E. T. (Dover).

## DIED.

MARCH 12th, R.F.C.—Dolan 120007 3rd Cl. Air Mech., J. (Nottingham).

## MISSING, BELIEVED DROWNED.

MARCH 13th, R.F.C.—Waud 8201 1st Cl. Air Mech. P. C. (Auckland, New Zealand).  
 MARCH 15th, R.F.C.—Rich 405678 L.-Cpl. C. E. (Anerley, S.E.).

## WOUNDED.

MARCH 12th, R.F.C.—Hopper 115569 Serjt. F. (Durham).

## PERSONAL NOTICES.

## ENGAGEMENTS.

GRESWELL—CURTIS.—A marriage has been arranged between Clement Hugh Greswell, R.F.C., son of Mrs. Caversham Simonds and stepson of Colonel Caversham Simonds, of Hawkrigge House, Newbury, and Victoria Margaret, eldest daughter of the late Sir William Michael Curtis, Bart., and Georgina Lady Curtis, of Caynam Court, Ludlow.

JONES—BUCKNALL.—An engagement is announced between Capt. John Hugh Oscar Jones, R.F.C., Ordre de la Couronne, Croix de Guerre, son of Mr. and Mrs. Charles Jones, of Hereford, and Charlotte Margaret Georgine Bucknall, elder daughter of the late John Lloyd and Mrs. Bucknall, of Marlborough.

LIVINGSTONE—COOPER.—The marriage arranged between Capt. A. F. Livingstone, R.F.C., and Miss Jeanette M. J. Cooper will take place at the Church of St. John the Evangelist, Edinburgh, on Tuesday, April 2nd, at 2 o'clock. All friends will be welcome at the church.

SIMMONS—BRANCH.—The engagement is announced of Lt. Stanley J. R. Simmons, London Regt., attd. R.F.C., of Cape Town, and Grace, daughter of Mr. Edward Branch, Chadwell Heath, Essex.

STEINBERG—GOING.—The marriage arranged between Capt. Herbert E. Steinberg, R.F.C., elder son of the late George Herbert Steinberg and Mrs. Steinberg, of Hampstead, and Edith Mayne, only daughter of Mr. and Mrs. Robert Going, 51, Kensington Hall Gardens, will take place on April 10th, at 2, at Brompton Parish Church.

## MARRIAGES.

GILPIN—ABBOTT.—On March 22nd, Lt. Frank E. Gilpin, R.G.A. and R.F.C., youngest son of Major and Mrs. Gilpin, Peshawar, India, was married to Ruby Maud, elder daughter of Mr. and Mrs. J. A. Abbott, Southwood, Belvedere, Kent.

McTURK—RYAN.—On March 16th, at St. Aidan's, Coulsdon, Lt. Cecil Dillon McTurk, R.F.C., only son of Mr. and Mrs. McTurk, of Darlington, was married to Eleanor, only daughter of Dr. and Mrs. Victor K. Ryan, of Coulsdon, Surrey, by the Rev. T. R. Roe, of Caterham.

NORMAN—GREEN.—On March 20th, in London, Lt. Geoffrey Norman, Irish Fusiliers and R.F.C., was married to Alma Doris Green, of Sheffield.

ROCKEY—STEWART.—On March 21st, at Crieff Parish Church, Perthshire, Norman F. W. Rockey, R.F.C., second son of W. Rockey, M.L.A., Johannesburg, South Africa, was married to Emma Hall, only daughter of Duncan and Mrs. Stewart, of Millhills, Crieff, Perthshire, by the Rev. Andrew Campbell, M.A., Crieff, assisted by the Rev. Andrew Gilchrist, B.A., Newington, U.F. Church, Edinburgh.

SHIPWRIGHT—HAIN.—On March 21st, Sec. Lt. Denis E. B. K. Shipwright, R.F.C., younger son of the late Thomas Johnson Shipwright and Mrs. Shipwright, was married to Kate, only daughter of the late Sir Edward Hain and Lady Hain, of Treloyan, St. Ives, Cornwall.

## BIRTHS.

BLAKE.—On March 14th, Margaret (née Hardey), wife of Capt. C. L. Blake, R.F.C., of a daughter. Address: 9, The Close, Lichfield, Staffs.

MARTYN.—On March 21st to Lt.-Col. R. Barry Martyn, M.C., R.F.C., and Mrs. Martyn—a son.

The special correspondent of the "Times" writing from The Hague on March 24th states that Capt D. Crosbie, R.F.C., and Lt. C. A. Gladstone, attd. R.F.C., are among the British officers who have arrived at Scheveningen from Germany for internment in Holland.

\* \* \*

The following officers, who were prisoners of war in Germany, have arrived in Holland for internment:—

Chidson, Lt. M. R., R.G.A., attd. R.F.C.  
 Humphreys, Capt. G. N., R.F.C.  
 Mayne, Capt. H. G. L., K.O. Scot. Bord., attd. R.F.C.  
 Rawson-Shaw, Lt. K., R.F.A., attd. R.F.C.

\* \* \*

The following officer, who was a prisoner of war in Germany, is reported as having passed through Switzerland en route for England:—

Reid, Lt. W., Liverpool R., attd. R.F.C.

[Owing to pressure on space it is again necessary to hold over all obituary notices.]

## AIR FORCE.

The Air Ministry on March 22nd issued the following comparison of the number of bombs dropped during February by the enemy in the area occupied by British troops in France, and the number dropped by the R.N.A.S., R.F.C., and Australian Flying Corps in enemy areas:—

	British.	Enemy.
By day .....	5,290	28
By night .....	3,553	1,768
	8,843	1,796

## FRANCE.

## OFFICIAL COMMUNIQUÉS.

MARCH 20th.—Yesterday the bad weather and fog hampered aerial operations along the whole front.

It is confirmed that the six German aeroplanes and captive balloon which were reported to have been damaged in fighting were really destroyed by our pilots on March 7th, 8th, 12th, 17th and 18th.

Yesterday and the day before our bombarding machines dropped during the day and the night 13,000 kilogrammes (about 13 tons) of bombs on aerodromes, cantonments, and railway stations in the enemy zone. Several explosions and two fires were observed in the buildings which were bombarded.

During the 16th Sub-Lt. de Meuldre brought down his 10th enemy aeroplane.

MARCH 21st.—Sub-Lt. Fonck brought down during the day of the 17th his thirtieth enemy machine.

ARMY OF THE ORIENT.—Allied aviators carried out several successful bombardments on enemy establishments in the valley of the Struma, in that of the Vardar, and to the north of the Moglena.

One enemy aeroplane was brought down in air fighting.

MARCH 21st.—ARMY OF THE ORIENT.—Allied aeroplanes made numerous successful bombardments of enemy establishments in the region of Seres and in the valley of the Vardar.

MARCH 22nd.—It is confirmed that Sub-Lt. Herbelin brought down his tenth enemy machine during the daytime on March 5th.

During yesterday (Thursday) two German aeroplanes were destroyed and four others seriously damaged as the result of fights with our pilots. In addition, three more enemy machines were brought down by the fire of our special guns.



**TAPES  
WEBS  
CORDS  
AND  
THREADS**  
*for* **AIRCRAFT**  
*ELECTRICAL & MUNITION WORK.*  
**JOHN MAC LENNAN & Co**  
30 Newgate St  
LONDON. E.C.1.



**AND AT GLASGOW.**

*Of special  
interest to Government  
Contractors.*

**J.B. BROOKS & CO<sup>L</sup>**

Contractors to the Admiralty, War Office,  
Air Board, Ministry of Munitions, etc.  
And the Leather Specialists with  
the Largest Works, Finest  
Equipment, Best Facilities, and  
widest experience in the Trade,  
invite enquiries for Articles,  
Parts, Fitments, and Cases of

**LEATHER**

*J.B. Brooks & Co<sup>L</sup>  
104 Criterion Works  
Birmingham.*



*Class 5 Imperial Acetylene Welding Plant.*

**OXY-ACETYLENE  
PLANTS**

**IMPERIAL LIGHT LTD.,**  
123, Victoria Street,  
LONDON, S.W.1.

Telegrams—  
"EDIERAC,  
PHONE,  
LONDON."

Telephone—  
VICTORIA  
3540  
(3 Lines)

THE USE OF

**NAYLOR'S  
Aero Varnishes**

WILL ENSURE A  
PERFECT FINISH

Many years' experience  
combined with up-to-date  
methods and scientific se-  
lection of materials ensure  
the production of var-  
nishes unexcelled for  
durability and reliability.

Some Specialities  
for Aero Work

Woodfillers, Stains, Air  
crew Varnish, Spar  
Varnish, Float Varnish,  
Hit Copal Finish for  
Dupe, Enamels, Engine  
Paints, etc., etc.

Free Samples for trial  
on application.

**NAYLOR BROTHERS (London) Ltd.**  
Contractors to all Government Departments.

Offices: 407/9, OXFORD ST., LONDON, W. Works: SOUTHALL MIDD.





MARCH 23rd.—During the period from March 11th to March 20th 26 German aeroplanes and one captive balloon were brought down by our pilots. In addition 19 enemy machines were seriously damaged and fell in their own lines.

On March 22nd five German aeroplanes were brought down or seriously damaged in air fighting.

During the night of March 22nd-23rd our bombarding squadrons dropped 16,000 kilogrammes (about 16 tons) of projectiles on the establishments, cantonments, and stations of the enemy's zone, where heavy damage was observed.

MARCH 23rd.—At 8.30 this morning several enemy aeroplanes, flying at a great altitude, succeeded in attacking Paris, but were immediately chased by our aeroplanes. Bombs are reported to have been dropped at several points, and there were some casualties.

10 p.m.—Enemy aircraft crossed our lines at 8.40 this evening, and bombarded several localities behind the front, without causing much damage. The raiders did not get as far as Paris. The alarm was given in Paris at 9.10, and the "All clear" was sounded at 10.10.

MARCH 25th.—Between Feb. 15th and March 15th our Air Forces have intensified their action, 142,000 kilogrammes (142 tons) of bombs having been dropped on aerodromes, munition depots, supply dumps, and groups of factories. Our chasers have shown much keenness. Fifty-two enemy machines were brought down or set on fire, fifty others were disabled. On our side we lost 29 machines, 19 of them on enemy territory.

Our reconnoitring machines have been specially vigilant; 652 flights for photographic purposes have been carried out, in the course of which 10,680 views were taken. Our observation balloons were on duty for 1,850 hours. Our aeroplanes carried out 12,105 flights on the field of battle. Air fighting has been developing in our favour, owing to the improvements effected in our material and the heroism of our aviators.

It is reported that Sous-Lt. Fonck has now completed over 1,000 hours' flight over the enemy's lines without having once been struck by a bullet or ever having had a single mishap. He holds the Croix de Guerre with 18 palmes.

Reuter reports that at 10.21 p.m. on March 22nd a group of enemy aeroplanes crossed the French lines. A certain number of bombs were dropped on Compiègne and various towns in the district. Some of the aeroplanes pushed farther south, but had to beat a retreat owing to the strong anti-aircraft fire. The alarm was also given in Paris, but half an hour later the "All clear" was sounded.

The "Journal" announces the death of Flt.-Lt. de Rochechouart de Mortemart, Prince de Tonnay-Charente, who has been mentioned in dispatches on many occasions for conspicuous bravery.

"Le Petit Parisien" announces the death as the result of an air fight of Sub-Lt. Schneider, a son of M. Schneider, the well-known steel manufacturer and proprietor of the Creusot armament works.

The "Matin," Paris, March 3rd, learns from Chanbly (Oise) that Prince Jerome Murat, who holds a commission in the French Aviation Service, has been severely wounded, and has had to have his left leg amputated.

Prince Jerome Murat was born in Paris in 1898, and is the youngest son of Joachim Napoleon, fifth Prince Murat. His brother Louis was killed last year. They are descended from the famous cavalry leader of the Emperor Napoleon.

The "Matin," Paris, March 21st, commenting on the supremacy of the French Air Service, says:—

During February we brought down 43 enemy aeroplanes and ourselves only lost eight machines. In 1917 we had 33 aviators, each of whom had brought down five enemy machines, while over 11 had scored more than 10 victories each. To-day we have 53 pilots with over five enemies to their credit, 17 of whom are "aces," each having over 10 victories to his credit. During February we dropped 101,000 kilogrammes (100 tons) of explosives upon German military objectives. We have maintained our technical superiority and increased our numerical superiority. The Germans have now against us two-thirds of their entire aerial strength.

[Presumably this means two-thirds of the Germans against the French and British on the West Front, and one-third against Italy and on all the other fronts.—Ed.]

The "Daily Express" correspondent, Mr. H. J. Greenwall, writing from Paris on March 20th, says:—

Although no official statement has yet been made, I am given to understand that the French Government does not intend to make any representations to England regarding the cessation of air raids on Rhine towns in order that Paris may be spared from further bombardments. Germany's "blackmail" policy has therefore failed once more.

M. Clemenceau, the Premier, has very wisely decided to make no public statement concerning air-raid reprisals, preferring to reserve any declarations he may think fit to make for the Army Committee of the Chamber.

Deputy Mayeras, one of the French Socialist Minority party, cried yesterday afternoon to force a debate on reprisals, but the deputies hooted him from the tribune. He wanted to know what arrangements the Government intended to make for the evacuation of Paris. There was more laughter than anger at this impudent question, and by 386 votes against 126 the Chamber decided to adjourn debate indefinitely.

The war in the air is the one topic of conversation in Paris, and on all sides are heard congratulations to the British aviators. Writing in the "Echo de Paris" this morning, M. Marcel Hutin remarks: "Before again trying to obtain revenge on Paris for work done by our British allies, General von Höppner would do well to think things over. The present silence of the French long-distance bombing squadrons may only be momentary."

The "Petit Parisien" (Paris, March 20th), referring to the aviation work of the Allies on the Western front, says:—"The Americans are beginning to reinforce our effective and to prove their own value. Baker, a famous American football and hockey player, already has two victories to his credit. Serjt. Putnam gained his first success on Jan. 15th, his second on Jan. 27th, and his third on March 15th. Before long 2,000 of them, perfectly trained, will take their place in the ranks of the Allied armies."

Reuter's correspondent with the American Army in France writes on March 19th, as follows:—

A German aeroplane this morning and last night flew over our sector north-west of Toul and dropped rubber balls, 18 inches in diameter, filled with liquid mustard gas. This is the first time, as far as is known, that aeroplanes have been employed on such an operation.

Luckily those dropped in our sector so far have not had any result worthy of being so called, but every man there was made furious by what is termed from one end of the sector to the other "dirty warfare." We have secured a sample of one of the rubber containers. The machine dropping them was an ordinary observation plane, apparently not even a bomber being necessary for this work.

Thee "Figaro" (Paris, March 18th) relates that during the recent air raid on Paris a bomb was dropped by one of the raiders near the Embassy of one of the Central Powers, causing damage to the building. Two days later the caretaker requested the Swiss Legation to present the French Government with a bill for about £160 for damage done.

The following, from the account of the "Times" correspondent in Paris, was dated March 10th:—

The raiders, while passing over Compiègne, dropped a few big bombs, which did not explode, and some equally inoffensive printed notices to the effect that the raid was a reprisal for the bombardment of the open towns of Trèves, Mannheim, Zweibrücken, and Pirmasens on February 18th, 19th, and 20th. On one side the notice is printed in German, and the other in French. It may be pointed out that this is the customary German lie to cover the raid. No French machine has bombarded Trèves, Mannheim, or Pirmasens.

It is estimated that 10 to 12 squadrons, or about 60 machines in all, attempted to reach Paris, but many were turned back en route, and only one or two actually crossed the barrage.

The "Times" correspondent writes of the raid which took place on March 11th, as follows:—

In spite of the large number of attacking aeroplanes and the number of bombs dropped, last night's raid was by no means as noisy as our London raids. The French barrage fire does not seem to be as intense as that which surrounds London, although last night it was clear that a number of new batteries had been brought into action.

[The restaurant table grouser will find much food for thought in the above statement, when he is tempted to compare the London anti-aircraft defences unfavourably with those of Paris.—Ed.]

Three French aeroplanes which left the oasis of Ouargla, Algeria, on March 14th, arrived the same day in In-Salah, having covered a distance of 750 kilometres (465 miles) in 7 hours 22 minutes.

#### GERMANY.

##### OFFICIAL COMMUNIQUÉS.

MARCH 19th.—We shot down in aerial battle yesterday and by fire from the earth 23 enemy aeroplanes and two captive balloons.

MARCH 24th.—Aviators and balloons brought valuable information to the Command. Our chasing and battle echelons, accustomed to victory, maintained, in hard fighting, the mastery in the air and attacked the retreating enemy columns. Motor



# UNDERCARRIAGES

WE can deliver promptly all types of UNDERCARRIAGES (Bristol, Avro, etc., etc.). Can we help you? Please send us your enquiries.

THE  
**RIVERS ENGINEERING**

CO., LTD.

(CONTRACTORS TO THE AIR BOARD),

27, LOTS ROAD, CHELSEA, LONDON, S.W.10.

Telephone: KENSINGTON 3116.

# LIGHT STEEL STAMPINGS

for  
**AEROPLANES**

Any size or weight :  
Rough or Machined:  
Single piece or Combination pressed and welded by Oxy-acetylene and other processes.

JOSEPH SANKEY & SONS, LTD.,

— Haeley Castle Works, Wellington, Shropshire. —

# AEROPLANE

We are making various Parts for Aeroplane Construction, including—

Tubes and Tubular Construction Sheet Metal Pressed Parts, Wheel Rims and Special Sections in steel of any length, gauge or width. Brazing, Acetylene, and Electric Welding, etc.

We can also make any Special Parts to instructions. Send us your enquiries.

**THE LOMBARD  
RIM & TUBE CO.,**

Lombard Street,  
BIRMINGHAM.

# PARTS

# Bowden

**BOWDEN  
CONTROLS  
AND  
BOWDEN CABLES  
FOR ALL  
AEROPLANE  
PURPOSES.**

Quotations on application.

Note Address—

**The BOWDEN BRAKE  
Co., Ltd., Tyseley,  
B'HAM.**



# Tyseley



troops, columns, and trains worked incessantly. The communication points in the rear of the enemy were the objective of our bombing squadrons, who were active every night.

From the "Daily Express" of March 25th:—

The Hamburg "Nachrichten," under the caption, "What British officers think about the German air raids," publishes the following statement, which, it declares, has been made by British officers in captivity in Germany.—

"The Germans are undoubtedly quite justified in bombing London as thoroughly as possible. The city comprises numerous factories and depots for war material; also it has a port whence these goods are shipped to France.

"The scare articles in the newspapers are nothing but sheer nonsense. They are intended for people who know nothing whatever about military matters.

"Their object is to excite and embitter the population and to maintain the flagging popular interest in the war."

[Which, making due allowance for propagandist editing, is very probably what the officers actually said.—Ed.]

Mr. R. H. Patrick Devitte, the "Daily Express" correspondent at Geneva, writing on March 20th, says:—

According to news received in Basle, the recent British aerial attack on Mannheim on Monday caused enormous damage.

Several portions of the town, principally in the neighbourhood of the station, were on fire for hours. Explosions took place in a powder factory and gasworks. Trams stopped, as great holes were made in the principal streets. Firemen, aided by soldiers, worked for 10 hours extinguishing the fires.

The people were in a panic, and they are in a state of constant anxiety, fearing further raids. Many are leaving the town and coming to Switzerland, especially women and children.

The "Frankfurter Zeitung" of March 12th says the police president and the Houseowners' Association in Frankfurt have issued an urgent appeal to all houseowners and householders to keep their street doors open when there is an air raid alarm, particularly in the late evening and the night hours, and to receive in their cellars persons seeking shelter.

[What a Paradise for burglars. It seems that the householder would be "let in" rather than the visitor.—Ed.]

The British raids on Coblenz and Freiburg produced a panic,

especially at Coblenz, where, according to a telegram from Basle, several fires were caused in the southern portion of the town. At Freiburg the station was again severely damaged. The Allied prisoners, who are specially lodged near the stations, cheered the aviators in spite of their danger and the possibility of punishment at the hands of the Germans.

Swiss travellers returning from Germany declare that the number of empty houses and flats in the principal Rhine towns shows a large increase. The people fear the Allied raiders will penetrate into Central Germany. Many are going into the Tyrol or Switzerland, and public opinion against air attacks is growing.

It is reported that the four principal Rhine towns have sent petitions to the Government in Berlin demanding that reprisal raids on French and English towns shall cease owing to the great danger to open German cities. They also ask for greater protection by anti-aircraft guns if negotiations fail.

Among recent German casualties, are several names of the German aviators of repeated mention, among others Flt. Lt. Bohme, commander of the Boelcke squadron and himself claiming 23 victories; Lt. Eschwege, serving with the Bulgarian army, who was shot down in Macedonia by Allied anti-aircraft guns after 19 victories; and Capt. Rudolf Kleine, commander of a fighting squadron, and earlier of a bomb-dropping one, which he led in the raid on London of July 7th. All of them had been awarded the Ordre Pour le Merite.

An Amsterdam message dated March 25th says that reports from Cologne state that enemy aviators "attempted" to attack the city last night. Eight bombs were dropped, but are stated to have occasioned no damage. One bomb was also dropped at Bonn.

## ITALY.

### OFFICIAL COMMUNIQUÉS.

MARCH 19th.—During the day in the course of aerial combats seven enemy machines were brought down; two of them by our own aviators in the Lagarina Valley, two by the French on the Asiago Plateau, and three by British aviators to the east of the Piave.

During the night one of our airships bombarded with good results the enemy railway lines in the Lagarina Valley.

MARCH 26th.—Our aviators set fire to two enemy captive bal-

SIXTH EDITION, 1918.

## DYKE'S AUTO-ENCYCLOPEDIA.

### THE STANDARD WORK ON MOTOR MECHANISM

Sanction has been given for this Book to be supplied through H.M. Stationery Office in Schools of Military Aeronautics  
Adopted by the American Government (War Dept.) for use in all their Aviation Schools.

A Thorough, Practical & Simple Treatise on Principle, Construction, Repairs and Troubles—and How to Remedy Them.

THE BOOK for the EXPERT and the STUDENT.

Containing upwards of 900 pages. 775 Illustrations on Electrical Subjects  
1,189 Illustrations on Repairs and Adjustments. 300 Illustrations on "The Ford."  
5 Coloured Inserts.

OVER 250,000 COPIES SOLD.

Price £1:1:0 net, post free, cash with order, from your Bookseller, or direct from the Publisher,  
S. G. GILLAM, Dome Building, RICHMOND, SURREY.

Prospectus on Application.

## Aluminium Castings

Contract to H.M. Government

### Chill Castings for Aeroplanes a Speciality

Telephone: 2846 City.  
4879 Central, talking London

Telegram: R.W.COAN

**R.W.COAN**  
The Aluminium Foundry  
219, GOSWELL ROAD, LONDON, E.C.



Sand or Die of every Description  
2 H.P. to 600 H.P.  
BEST METAL  
GOOD CASTINGS  
QUICK DELIVERIES



# OFFICIAL ACCEPTANCE TESTS

## LAND MACHINES.

S.P.A.D.	Avro
Sopwith	Armstrong-
B.E.	Whitworth
Short	D. H. A.
Curtiss	Handley-Pages
Mann, Eserton	Bristol
M. Farman	Vickers
H. Farman	Ni-uport
Morane	Supermarine, &c.

## SEAPLANES.

Short, Sopwith, America Boats, F.B.A. Boats, Curtiss Boats, Norman-Thompson, A. D. Boats, &c.

*Private Aerodromes  
Surveyed and Pilots'  
Reports Furnished.*

## DELIVERY AND EXPERIMENTAL FLIGHTS ON LAND MACHINES & SEAPLANES.

COMPLETE REPORTS FURNISHED.

Rates on application to

THE  
**PRODGER - ISAAC**  
AVIATION COMPANY

(C. B. Prodger and Bernard Isaac),  
166, Piccadilly, London, W.1.

Telephone: Gerrard 278 (2 lines.)

Telegrams: "Aeromila, Piccy, London."

## CLIFFORD B. PRODGER

J. LANKESTER-PARKER,  
and other Pilots.

Approved Admiralty Pilots  
—for Acceptance Trials.—

## INSURANCE.

WE are now in a position to quote low rates, through our brokers at Lloyd's, for the Insurance of Aircraft during ACCEPTANCE TRIALS AND DELIVERY FLIGHTS with an excellent and most comprehensive Policy. May we quote you for your new contracts?

SPECIAL ARRANGEMENTS with Sub-Contractors for HANDLEY-PAGE Type Land Machines or "AMERICA" Type Flying Boats



**AIRCRAFT DEPARTMENT**



THE WORLD'S LARGEST MANUFACTURERS OF ALL KINDS OF ENGRAVED METAL GOODS

**British Metal (Kingston) Ltd.**  
*The Factory,*  
**Kingston on Thames**

**DIALS & INSTRUCTION PLATES**  
 MADE IN ANY METALS,  
 IVORY, IVOROID, BONE, ETC.  
 ANY QUANTITIES, WORDING, DESIGN,  
 SIZE, SHAPE OR COLOURS.

— — — — —

**COMPLETE SHEET METAL**  
**AIRCRAFT COMPONENTS**  
 RIVETED, SWEATED, BRAZED OR WELDED.  
 R.E., F.E., B. & D, B.E., C-D-E,  
 SE, DE H.  
 RESIDENT A.I.D. EXAMINER.

**HIGH-CLASS**  
**ALUMINIUM**  
**CASTINGS**

**FOR ALL TRADES.**

We Specialise in Aluminium Cylinders and  
 General Aero and Motor Engine Castings,

**CAST IRON**  
**CYLINDERS**

Water and Air-cooled for Aero & Motor Engines

ALL THE ABOVE CASTINGS  
 TO GOVERNMENT SPECIFICATION.

**WILLIAM MILLS, LTD.,**  
 Atlas Works :: Grove Street,  
**BIRMINGHAM.**

**ALUMINIUM AND IRON FOUNDERS.**

**MOSS—**  
**AERO-ENGINE GEARING**



Manufactured  
 on principles ensuring  
 greatest

**STRENGTH**  
 AND  
**ACCURACY.**

**GEARING — FLYWHEELS — CAMSHAFTS**  
**R.A.F. PROPELLER BOSSES**

Our Aero parts are made in specially **HIGH TENSILE**  
**STEEL**, heat treated and all parts corrected for distortion

**TRANSPORT, LORRY & PLEASURE CAR GEARING**

Bevel and Worm Drives accurately generated. Steering Worms and Sectors.  
 Spur and Bevel Differentials. Gear Box Gears. Camshafts with guaranteed  
 Glass-hard Cam Profiles.

**—GEARING**

**THE MOSS GEAR CO., LTD.**  
 \* DUCKITT \*  
 Managing Director, Thomas St., Aston, BIRMINGHAM

TRADE  
  
 MARK

**Bowden**  
**Wire Ltd.**

**LONDON**

Victoria Road, Willesden Junction, N.W.10.

THE varied uses and adaptations of  
 Bowden Wire mechanism are recog-  
 nised by almost every department of  
 State Service. The war work which we  
 have in hand for Home and Allied  
 Governments precludes for the pre-  
 sent our acceptance of private orders.

*Established 1897.*

Godbolds

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



loons at Conegliano (six miles north-east of Montello) and Colnirano (Alano Basin) (north of Mt. Tomba). Two hostile aeroplanes were brought down; one of them by French aviators at S. Giacomo di Veglia (east of Mt. Tomba), the other by British aviators on the Asiago Plateau.

MARCH 21st.—On the evening of the 19th our anti-aircraft batteries shot down an enemy aeroplane at Campo di Pietra (north-east of Zenson) (Middle Piave) and a seaplane on the seashore at Cortellazzo (mouth of the Piave).

MARCH 22nd.—Our own and French aviators shot down an enemy machine above the Asiago Plateau; beyond the Piave British aviators brought down three more hostile aeroplanes, and forced a fourth to land. South of Motta di Livenza our artillery set fire to an enemy captive balloon.

MARCH 24th.—Army and naval airships accomplished successful raids against the enemy aviation camps, dropping five tons of explosives on the night of March 11th.

On the following day they bombed the important aviation camp of Comina, near Pordenone, where enemy machines started on raids of destruction against Venetian towns, great conflagrations being visible.

On the nights of March 17th and 18th Italian dirigibles successfully bombed the aviation camps at Godego and Motta di Livenza. On the night of the 19th an Italian airship effected a successful surprise raid on Mattarello Station. All the objectives were hit, violent explosions and fires occurring.

Between March 11th and 19th Italian airships dropped 14 tons of explosives on enemy military objectives with good results, demonstrating the usefulness of airships if capably managed.

MARCH 25th.—There was remarkable aerial activity above the fighting lines. Four enemy machines were brought down on the left side of the Piave, two of them by British aviators. During the preceding day two more hostile aeroplanes had been shot down above Tonzetta and the Montello by our own and French aviators.

The railway lines in the Val Lagarina and the enemy aviation grounds on the Livenza were bombed by our aeroplanes.

\* \* \*

A "Daily Express" correspondent writes from Rome on March 19th that British aviators have just accomplished a record flight from Hendon to Otranto.

Flt. Comdr. Joyce, R.N., with Petty Officer Lee as passenger, started from Hendon, crossed Dover, Paris, Vendôme, Lyons, Fréjus, Pisa, Rome, and Foggia to Otranto.

They were actually in the air for 16 hours and 55 minutes, or including local flights, 18 hours and 2 minutes.

#### BELGIUM.

##### OFFICIAL COMMUNIQUÉS.

MARCH 20th.—A German biplane was obliged to land yesterday in the neighbourhood of Parme. The officer and non-commissioned officer on board the machine were taken prisoners.

MARCH 23rd.—In the evening of the 21st inst. a German bombarding aeroplane, hit by artillery fire, was forced to land in our lines. The crew of two officers and one non-commissioned officer were taken prisoners.

#### TURKEY.

##### OFFICIAL COMMUNIQUÉS.

MARCH 19th.—Aerial activity was also lively. There is nothing else to report, owing to rain and fog.

MARCH 22nd.—On the Tigris an English aeroplane was shot down during an air fight.

#### GREECE.

The Ministry of War states, March 22nd, that a radiogram received on March 21st from the aerial service announced that an airship had been sighted above Crete, going in a northward direction. As a result all lights were extinguished last night in Athens.

#### EGYPT.

The public was officially informed at Cairo on March 21st that a hostile airship had been observed on the coast, and was warned of the possibility of raids and enjoined to observe precautions.

### AN INDUSTRIAL HONOUR.

The Queen, accompanied by the Prince of Wales and Prince Henry, visited the works of Gwynnes (Limited) in the Thames Valley on March 19th, to see in operation processes connected with the production of engines for aeroplanes. The King inspected the works some little time ago. The Royal visitors were received by Mr. Neville Gwynne (managing director), Mr. J. Dewar (director), Mr. Cannell (general manager), Mr. Sumner (works manager), and Mr. Wilkes, who for 45 years has been secretary of the establishment, and Major Davson, of the Department of Aeronautical Supplies, was in attendance. A guard of honour composed of silver-badged men was mounted outside the works.

**The Air Navigation Co., Ltd.**

## BLERIOT & SPAD AIRCRAFT WORKS, ADDLESTONE (SURREY).

**Contractors to War Office and  
Admiralty.**

**Flying Ground—Brooklands Aerodrome.**

**NORBERT CHEREAU, Managing Director.**

Telegrams—Bleriot. Weybridge.

Telephone—353 Weybridge.

## SALMSON AERO-ENGINES

(Canton-Unné System).

All enquiries should be addressed to

**THE DUDBRIDGE IRON WORKS, L<sup>d</sup>.  
STROUD,  
GLOUCESTERSHIRE.**

London Office:

87, Victoria Street, S.W.1.

KINDLY MENTION "THE AEROPLANE"



## Suits Aviation

THE

## "Air-Velope"

Built up on entirely new scientific lines.

The details of which we shall make known shortly.

**POSITIVELY  
COLD, WIND &  
WET PROOF.**

As sketch, with  
Fur Collar,

**£10 10s.**

**Robinson  
& Cleaver**

The Linen Hall,  
Regent Street, London, W.

WHEN CORRESPONDING WITH ADVERTISERS.



# Blackburn

## AIRCRAFT

On  
ADMIRALTY  
and  
WAR OFFICE  
List.  
BLACKBURN  
AEROPLANE  
and MOTOR  
CO., LTD.  
Olympia,  
LEEDS

Efficiency of design and construction.

Steele's Advt. Serv.

Telephones:  
Gosport 217.  
Southampton 1861.  
London: Gerrard 5716

Telegrams:  
"Flight, Gosport."  
"Flying, Southampton."

### GOSPORT AIRCRAFT CO.

HEAD OFFICE: GOSPORT.

WORKS: GOSPORT & SOUTHAMPTON.

Sir Charles Allom.  
Charles E. Nicholson.

London Office: 15, George Street  
Hanover Square, W.1.

**BLACK  
ENAMEL.**

**AEROPLANE  
GREY PAINT (fat).**  
Oil and Petrol  
Resisting.

**TRANSPARENT  
WOOD FILLER.**

**Subject to  
A.I.D.  
Inspection.**

## HARLAND'S

VARNISHES, ENAMELS  
AND FINE COLOURS.

By Appointment to



His Majesty the King.

**MERTON, LONDON S.W.19.**

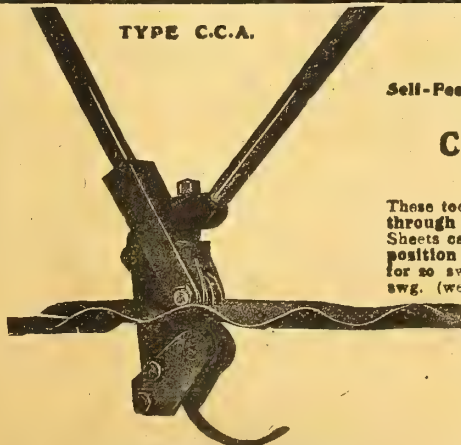
ESTABLISHED 1791.

**OPAL  
VARNISHES  
for  
AIRSCREWS  
and  
EXPOSED  
WOOD PARTS,  
&c.**

**WHITE DOPE  
RESISTING PAINT.**

**Subject to  
A.I.D.  
Inspection.**

TYPE C.C.A.



## TANGENT

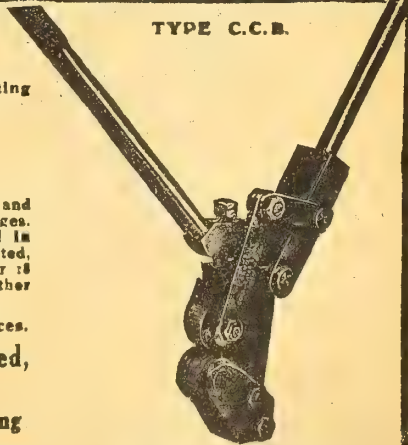
Self-Feeding HAND TOOLS Non-Distorting  
FOR CUTTING

**CORRUGATED SHEETS**  
PATENT.

These tools will cut sheets on any angle, limited curves and through the centre with no distortion of cut edges. Sheets can be cut to required shape when being fixed in position on the job. Made in two styles, as illustrated, for 20 swg. (weight 5 lbs.), with compound leverage for 18 swg. (weight 6 1/2 lbs.). Cuts 100% faster than any other hand method.

Write for Illustrated Pamphlet and Prices.  
**Montgomery, Smith & Co., Limited,**  
Patentees and Manufacturers,  
Tangent Wks., Keynsham, Somerset, Eng

TYPE C.C.B.





# PROPELLERS ONLY.



**CONTRACTORS TO  
H.M. GOVERNMENT**



Office & Works—  
Propeller Works,  
Balm Road,  
Hunslet,  
Leeds.

Telephone—  
Central 291.  
Telegrams—  
Aircrews, Leeds.

# Aircraft Fittings.

## GABRIEL & CO.

**Manufacturers of  
AEROPLANE FITTINGS in BRASS,  
COPPER, GUN METAL, BRONZE  
AND GLARUS ALUMINIUM.**

Castings supplied either Machined complete  
or in the rough.

Sheet Metal Work in Brass, Copper, Steel,  
Tin, or Aluminium, including Spinings,  
Stampings and Pressings.

**A.G.S. FLANGES, PETROL FILTERS, ETC.**

Tube Bending and Capstan Work a speciality.

**Contractors to Admiralty, War Office,  
Ministry of Munitions, H.M. Air Board,  
Royal Aircraft Factory and Crown  
Agents for the Colonies.**

TEL. ADDRESS:  
GABRIEL, BIRMINGHAM  
TELEPHONE:  
CENTRAL 1248.

**4 & 5, A. B. ROW,  
BIRMINGHAM**

Telegraphic Address: POETRY. 'PHONE LONDON.  
Telephones: AVENUE 996, 996, 7996.

(Partners:  
H. W. PRITT,  
W. G. PRITT,  
P. W. SMALLWOOD,  
E. R. HILL).

## PRITT & CO.

**METAL WAREHOUSEMEN, MUNITION  
AND AERONAUTICAL CONTRACTORS**

**46, FENCHURCH STREET,  
LONDON, E.C. 3,**

Where all communications must be addressed.

**CITY WAREHOUSES:** 62a, Vine Street, Minories, E.  
9, Jewry Street, Aldgate, E.C.

**DEPOTS:** Paddington, Poplar, Shoreditch.

We hold good stocks, complying with Air Board, R.A.F.  
and Admiralty Specifications, of the following:

**BRASS & COPPER** in sheets, tubes, rod, wire, etc.  
**TINNED STEEL SHEETS.**  
**MILD STEEL SHEETS.** 9a.  
**BRIGHT DRAWN MILD STEEL BARS.** 3a.  
**A. G. S. BOLTS, NUTS AND WASHERS.**  
**COPPER RIVETS.** **TINMAN'S SOLDER.**  
**SOLDERING IRONS.**  
**BEST SWEDISH WELDING WIRE.**  
**BRAZING SOLDER** in wire and granulated Form.  
**SILVER SOLDER.** **WIRE GAUZE, &c.**

All material passed A.I.D. before despatch.

**DAILY DELIVERIES** made by our own vans within a radius of  
15 miles of our Warehouses.

**NOTE.**—All orders for Aeronautical Work receive especially  
prompt attention.

**WE ARE BUYERS OF SCRAP BRASS & COPPER.**

## THE BRITISH WRIGHT CO. LTD.

Owners of the British, Italian and Belgian Patents  
of Wilbur and Orville Wright.

**Manufacturers of  
AERONAUTICAL  
INSTRUMENTS**

**FOR  
NAVY & ARMY AEROPLANES**

**Ogilvie Air Speed Indicators**

For use on Aeroplanes, Airships, Kite  
Balloons and Air Stations.

**Statoscopes:**

**Recording Manometers:**

**Wind Speed Recorders.**

At present the Government is taking the entire output, but  
British and Foreign Firms are invited to place their orders  
now for delivery of Aeronautical Instruments after the war.

**The BRITISH WRIGHT Co. Ltd.**  
**33, CHANCERY LANE, LONDON, W.C.2.**





**STANLEY AVIATION Co.**

PROPELLERS, FUSELAGES,  
PLANES, RUDDERS, FINS, SKIDS ETC.

CHATHAM PLACE, MORNING LANE, HACKNEY, E.9.

THE  
TEL.  
45.  
DALSTON

**“NOVELLON” DOPE  
AND AEROPLANE VARNISH.  
CELLULOSE ACETATE & CHEMICALS**

**BRITISH CELLULOSE & CHEMICAL MANF'G.  
COMPANY, LIMITED.**

Telegrams:

Cellutate, London.

8, WATERLOO PLACE, S.W.1.

Phone: Regent 4045.

Works: Spondon, Derby; and Maybury Gardens, High Road, Willesden Green, N.W.10.

(Telephone: Willesden 2380.)

The **LARGEST** and most Up-to-date  
**CIVILIAN SCHOOL**  
in ENGLAND.

**LEARN TO FLY at  
BOURNEMOUTH**

IMMEDIATE  
VACANCIES.

12

Solo and Dual

Aeroplanes in USE. Over 20

other Aeroplanes and Engines in stock.

School Approved by R. Ae. Club.

PUPILS COACHED FOR THE AIR SERVICES.

Particulars from **BOURNEMOUTH SCHOOL OF FLYING, BOURNEMOUTH.**

**THE SIBERIAN & GENERAL TRADING CO., LTD.**

Can supply from stock or for prompt shipment

**PLYWOOD**

IN ALL WOODS, SIZES AND THICKNESSES.

**SPECIALITY: BOARDS FOR AIRCRAFT WORK.**

**HEAD OFFICE: 33, BISHOPSGATE, LONDON, E.C.2.**

Telegrams—Wolosey, Led, London.

Telephone—London Wall 3577.

KINDLY MENTION “THE AEROPLANE” WHEN CORRESPONDING WITH ADVERTISERS.



CONTRACTORS TO H. M. GOVERNMENT

**W.T. CLARK & CO.**Telephone  
No.  
Central  
2121.5, GREEN TERRACE,  
ROSEBERY AVENUE,  
LONDON, E.C.1.Telegrams  
Etalspinne  
Living London.  
Two Words**METAL SPINNERS**  
and  
**SHEET METAL WORKERS**

for Aeroplane Constructors

**METAL SPINNINGS for AEROPLANES**

Cowlings (COMPLETE SET)

Coverings  
UndershieldsFairings  
Petrol Tanks  
Shields etc.BEATEN COWLS  
OF EVERY  
DESCRIPTIONSPUN COWLS  
UP TO  
48 INCHES  
IN DIAMETER.**BRIGHT BOLTS & NUTS** $\frac{1}{4}$  in. diam. & upwards

(Suitable for Every Description of Engineering Work)

**QUALITY, ACCURACY AND FINISH GUARANTEED****THE  
"HELICOID" LOCK-NUT**

(THE FINEST LOCK-NUT IN THE WORLD.)

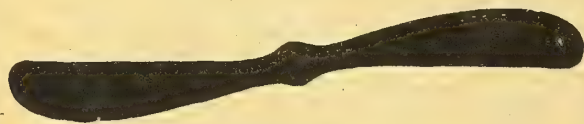
This nut will remain secure, no matter how great the vibration may be—in fact vibration actually tightens the grip.

(made from  $\frac{1}{16}$  in.  
to  $2\frac{1}{2}$  in.)(sample nut & prices  
on application)

We also manufacture Wrought Iron Railing and Gates, etc.

**BAYLISS, JONES & BAYLISS.**  
LTD.**WOLVERHAMPTON.**

London Offices: 139/141, CANNON ST., E.C.4.

**CHAUVIÈRE'S  
Integral Propellers**are used more extensively than  
any other Propeller in  
the World.**Hold all Records and are  
indisputably the best.****Maximum Efficiency.  
Best Workmanship.****THE INTEGRAL PROPELLER CO., LTD.**

Edgware Road, The Hyde, Hendon, N.W.2.

Telegrams: "Avirop, Hyde, London." Telephone Kingsbury 104.

Contractors to H.M. Government.

**SWIFT  
AVIATION CO.****Dolphin Engine Plates in Stock,  
Complete Sets.***Speciality Sopwith Spares.***KINGSTON**PHONE—  
762 KINGSTON'GRAMS—  
"SWIFT, KINGSTON"

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# R. F. & F. W. BROWN

(F. W. BROWN.)

Wollaton Saw Mills  
Near Nottingham

## ENGLISH ASH FOR AEROPLANES Bent Timber Manufacturers.

Telephone .. 1526 Nottingham.

Telegrams .. Browns, Sawmills, Wollaton.

### A.G.S. WASHERS

Wire  
Work.

### THIMBLES

Turn Buttons.  
Eyelets.  
Washers.

### UNION NUTS & NIPPLES.

W. H. BRISCOE & Co., Ltd.,

51, 52, 53, PARK STREET,  
BIRMINGHAM.

Tel.: 550 Central  
Tel. Ad.: BRISK, BHAM.

Registered Trade Mark.



Non-Inflammable Transparent Celluloid.

LONDON LABEL CO., Ltd.,

Contractors to H.M. Government.

HARLEY WORKS, BECKTON RD., LONDON, E.

### WIND SHIELDS MAP COVERS OBSERVATION PANELS *Prompt deliveries of every type.* LUMINOUS PRINTING

Labels for Instrument boards, &c., for night work.

Any special article made up to templates or drawings  
and delivered by return.

N.B.—Nonflamoid is very much lighter and easier to work than  
any kind of glass, also it will stand much harder usage.

## THE AIRCRAFT CONSTRUCTION CO.

EVERY DESCRIPTION OF METAL COMPONENTS.

### Immediate Delivery of SE SUMPS.

HARLEY AEROPLANE WORKS, Beckton Rd., E. 16

Telegrams: "Aercracons," Canning, London.

'Phone: East 1300.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



THE

**"BOWSER" AEROPLANE SEATS**

(Made to A.G.S. Drawing 264).

Supplied to the Royal Aircraft Factory and the Leading Aircraft Manufacturers.

Manufactured by **EDWARD BOWSER, 50, Park Lane, Leeds.** Tel. No.: Central 3473.

Under the A.I.D. Inspection.

Northern Representative—

Mr. WALTER M. DANIELL,

33, East Beach, Lytham.

**EBORA**  
PROPELLER  
COMPANY  
11 & 12 Surbiton Park  
Terrace KINGSTON  
on Thames  
Telephone  
KINGSTON 672  
Telegrams  
EBORA, Kingston

# Ebora Propellers

Contractors  
to the Admiralty  
and War Office  
**SCHOOL PROPELLERS**  
**FOUR BLADES**  
**SEAPLANE PROPELLERS**  
**SLATE TABLES FOR**  
**PROPELLER WORKS**

**RUBBER PETROL RESISTING HOSE, TUBING & CONNECTIONS**PHONE  
CITY 3811  
3812

WASHERS, RINGS, BUFFERS, SHEET, STRIP, MATTING, MOULDINGS.

**JAMES LYNE HANCOCK, Ltd., 266, Goswell Rd., London, E.C.1****HIDE GLUES****FOR AIRSCREWS AND  
AIRCRAFT CONSTRUCTION.**

— APPROVED —

Manufacturers—**Wm. OLDROYD & SONS, Ltd., 9, Mincing Lane, London, E.C.3.**

Telephone: 4978 Avenue

Telephone—East 3833.

**THE STANDARD Aircraft Manufacturing Co., Ltd.**

28, BOW COMMON LANE, LONDON. E.3.

**Lang Propeller LTD.**Contractors to  
the Admiralty  
and War Office.**WEYBRIDGE,  
SURREY.****FREMO  
TAPER****PINS**

Does the taper  
pin enter into your  
products? If so,  
your reputation  
may easily rest  
upon a taper pin.  
We supply only  
taper pins which  
build and main-  
tain reputations.

**Fredk.  
Mountford  
Ltd.**

Fremo Works,  
Lifford,  
BIRMINGHAM

**Aeroplane Steel Sheets**

as supplied by us to

**The Royal Aircraft Factory  
and leading Aeroplane Makers**

Guaranteed to comply with the R.A.F. No. 9A  
specification. Stocked in all gauges. (Sheets  
are passed and stamped by the "A.I.D.")

**BERNARD NICKLIN & CO.**

IRON AND STEEL WAREHOUSE  
SMETHWICK, BIRMINGHAM

Telegraphic Address:  
"Bernico," Birmingham.

Telephone No. 1  
224 Smethwick.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



## THE POOLE AVIATION CO. POOLE, DORSET.

*Contractors to H.M. Government.*

**Spares and all Parts of Machines.**

**ENQUIRIES INVITED.**

'Phone: Poole 54.

'Grams: Aviation, Poole.

## HEATING AND VENTILATION

DOPE SHOPS, AERODROMES,  
AND AIRCRAFT FACTORIES.

**WHEELER & SONS,** Phone—  
PARK 652.  
1a, VICTORIA GARDENS, LONDON, W.11.

## HEATING, DRYING AND VENTILATION.

**Kinnell's**

OF DOPE SHOPS, AERODROMES AND  
AIRCRAFT FACTORIES, &c. OF EVERY  
DESCRIPTION. List 1134 free.

**C. P. KINNELL & CO., LTD.** Phone—  
Hop 372  
65, SOUTHWARK ST., LONDON, S.E.1.

Manufacturers  
of.

**PHOSPHOR BRONZE,**

**GUN METAL,**

MANGANESE BRONZE,

**BRASS & COPPER,**

TUBES, SHEETS,  
RODS, WIRE, AND

**CASTINGS.**

PHOSPHOR TIN,  
PHOSPHOR CO PER.

**CHARLES CLIFFORD & SON, LTD.,**  
BIRMINGHAM.

REPETITION  
WORK in large quantities.

WAR  
SERVICE  
ONLY

SMALL

## PRESSINGS

STAMPINGS

AND

BENT WIRE GOODS

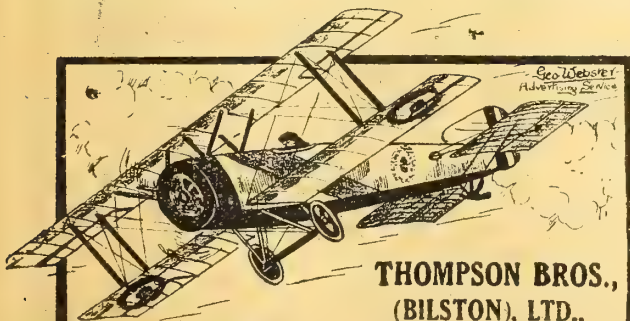
SEND US YOUR ENQUIRIES

**SMITH AND DAVIS, LIMITED.**

Stampers and Piercers,  
HAMPTON STREET, BIRMINGHAM.

## "CROID" LIQUID GLUE

Adopted by  
H.M. Admiralty, etc.  
Sol. Manufacturers:  
The Improved Liquid  
Glues Co., Ltd.,  
Gt. Hermitage Street  
London, E.  
Contractors to H.M.  
Government.



**THOMPSON BROS.,  
(BILSTON), LTD.,**

— FOR —

**UNDERCARRIAGES  
TUBULAR FRAMEWORK  
AERO. DEPT. BILSTON, Staffs.**



KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



## TRADE CARDS.

## AEROPLANE TIMBER SPECIALISTS

**JOSEPH OWEN & SONS, Ltd.,**  
**Borough Saw Mills, LONDON, S.E.**  
 Telephone: HOP 8811 Telegrams: "BUCHERON, SEDIST,"

## Advertising

For GOOD ADVERTISING consult  
 Godbolds, 8, Breems Buildings,  
 London, E.C.4. Estimates Free.  
 Phone: City 5912. E. H. Godbold,  
 Director



Willesden 33 **H. BURTON & CO., LTD.,** Slotting  
 Phone-London.  
 CANNON WORKS, WILLESDEN, N.W.10.

A.G.S. FILLERS, FILTERS, COCKS, FLANGES, UNIONS, Etc.  
 PETROL COCKS, UNIONS, TEES, ELBOWS, FOUR-WAYS,  
 Etc., H.P. TANK FITTINGS.

**DELIVERY FROM STOCK** Ask for Particulars  
 of our Stock.

## FREDK. WARD

— FOR —

## Aero Engine and Gun Gear Parts

ALSO PATTERN AND JIGS.

ALLSOP ST., UPPER BAKER ST., N.W.

Phone: Paddington 4748.

## NAME PLATES.

WE SPECIALISE IN EVERY DESCRIPTION OF  
 NAME PLATES IN METAL, VORINE, ETC.

**CLEGG METAL ENGRAVING CO.,**  
 CHATSWORTH WORKS, WORTHING.

## ALWIN ENGINEERING CO., AERONAUTICAL

A. E. CARTLIDGE.

LUTHER ROAD, TEDDINGTON, S.W.

Tel. No. Kingston 2412.



Makers of all kinds of Aircraft Fittings.

Presswork a Speciality.

Pressings for DeH, etc.

Avro, Sopwith, Fairey and many other types.

On receipt of Post Card our Representative will call and  
 give immediate quotation.

## Springs! Springs! Springs!

We make a speciality of  
 Springs for Aeroplanes.  
**SEND FOR PRICES.**

**Dart Spring Co., West Bromwich.**

## SYSTEMS at RACING &amp; ROULETTE

A book of absorbing interest to all System lovers,  
 showing how a regular and substantial income  
 can be earned with small capital.

Price—THREE PENNY STAMPS.

SIMPLEX PUBLISHING, 1, NEW OXFORD STREET, LONDON, W.C.1

## Clean Coloured Rags

### FOR CLEANING & WIPING.



Best and Cheapest for Munition Works :  
 Engineers, Printers & Bus Companies, etc.

**A. JOSEPH, EARL STREET, LONDON ROAD,**  
**LONDON, S.E.1.**

Telephones: Hop 83, 361 &amp; 4272.

"Cheaper than cotton waste."

## P.D.V. Aircraft Company, Ltd.

All Metal Parts for Aircraft made, comprising the  
 following machine work: Milling, Turning,  
 Shaping, Press Work, Slotting, Drilling, Grinding and  
 Sheet Metal Work. Well-equipped Welding and Brazing Plant.

Enquiries to

P.D.V. AIRCRAFT COMPANY, Ltd.,

Offices &amp; Works:

Princes Street, Richmond, Surrey.

Telegrams: Asres, Richmond.

Telephone: 1681 Richmond.

## Chauvière's famous Integral Propellers

HOLD ALL RECORDS; USED BY ALL  
 LEADING AVIATORS. THE BEST

Sole Proprietors for Great Britain and Colonies

**THE INTEGRAL PROPELLER CO., LTD.,**  
 Edgware Road, The Hyde, Hendon, N.W. 9.

Telephone—Kingsbury 104. Telegrams—"Aviprop, Hyde, London."

## EBORA PROPELLER COMPANY LTD

*Ebora*

## PROPELLERS

Contractors to the ADMIRALTY &amp; WAR OFFICE

11 &amp; 12 SURBITON PARK TERRACE, KINGSTON-ON-THAMES

Telephone: KINGSTON 672

Telegrams: "EBORA, KINGSTON"

## SCREW-DRIVING

### RUSSELL BROTHERS, Ltd., REDDITCH

## MACHINES.

Trade MENDINE Mark.

## LIQUID SCOTCH GLUE

USED BY THE LEADING AEROPLANE CONSTRUCTORS.  
 MOISTURE PROOF.

Write for Price List and Particulars.

MENDINE CO., 8, Arthur Street, London Bridge, E.C.

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.



# SHENSTONE & CO., AIRCRAFT DEPT., GRANGE ROAD, LEYTON.

Owing to our constantly increasing output we have vacancies for First Class Hands in the following Departments.

**MALE** **WOODWORKERS.**  
**PATTERN MAKERS.**  
**CARPENTERS & JOINERS.**  
**SPINDLE HANDS.**  
**JIG MAKERS.**

**FEMALE**

**COVERING.**  
**RIB MAKING.**  
**SEWING.**  
**VARNISHING.**  
**DOPING.**

General Manager—E. KEITH DAVIES.

Telephone—Walthamstow 24.

## MISCELLANEOUS ADVERTISEMENTS.

### AVIATION

#### AVIATION INSTRUCTION

on up-to-date lines, by a qualified Engineer in Aeronautics. Demonstrations from complete set of parts, and sectioned models.

Send for Prospectus No.1.A.,

**THE MOTOR TRAINING INSTITUTE LTD.,**

10, Heddons Street, Regent Street, W.1.

### FOR SALE.

**Gough-Turner Inclinator and Bankline-meter** (for defining flying angle on curves). Unaffected by vibration. As supplied for H.M. Seaplanes.—7a, Eldon Grove, Manchester.

**For Sale** as a going concern. Firm of cabinetmakers, specialising very highest class of work, with large home and export trade doing large pre-war business, with prospects of great extensions after the war. Firm now engaged in manufacture of aeroplane propellers producing very high-grade article, with excellent reputation, situate 30 miles N.E. of London, with good rail facilities, cheap power, employing approximately 50 hands. To be sold as a going concern. Particulars will only be given in strict confidence and to genuine purchasers.—Address inquiries to S. P. K., Box No. 3472, THE AEROPLANE, 166, Piccadilly, W.1.

**Woodworking Machinery** for sale, suitable for aeroplane work. General woodworker, consisting of band-saw, spindle moulder, slot-mortiser, complete with saws and cutters. Eight-inch hand-feed planer, with ring oiling bearings. Both modern machines, and had little wear, by Kirchner. £55 the lot, free on rail for quick sale.—Wykes, Lynn Road, Ely, Cambs.

**Tarpaulins.**—Waterproof khaki sheets for sale; also few second-hand railway truck tarpaulins; London works.—For prices and particulars write Johnston, 12, Broughton Road,

**Wanted Aeroplane Propeller Cuttings,** mahogany and walnut. Any amount for cash.—Box No. 3423, THE AEROPLANE, 166, Piccadilly, W.1.

**Sheetmetal and Coppersmiths' work wanted.**—Midland firm is open to receive inquiries for tanks, sockets, fairings, and pipework, etc. Best work and prompt deliveries guaranteed.—Box No. 3415, THE AEROPLANE, 166, Piccadilly, W.1.

**Plating and Polishing.**—We undertake any kind of nickel, copper, tin or brass plating. Mat or bright finish. Copper or steel tube Bending and Brazing.—Mona Plating Works, Barretts Grove, Stoke Newington, N.16.

**Wanted, Sheet Metal Work and Oxy-Acetylene welding combined,** high-class workmanship and prompt delivery.—Manwood, Miller and Co., Dukinfield.

**Wanted, firm having machines available,** also Die heads with High Speed Dies, could undertake fairly large quantities of threading work in  $\frac{1}{4}$ -inch,  $\frac{9}{32}$ -inch and  $\frac{5}{16}$ -inch B.S.F. Right and left-hand threads.—Box No. 3438, THE AEROPLANE, 166, Piccadilly, W.1.

**Camera Wanted.**—Must be high class instrument with fast lens;  $\frac{1}{2}$  pl. or smaller preferred.—Browne, 7, Eden Street, London, N.W.1.

**Best Process. Aluminium Repairs.** No distortion. Cylinder welding and reborring. New pistons (certificates only).—Address, Aluminium Repair Co., 60, Hardman Street, Manchester. Tel., 4087 City.

**Rubber Twill Cuttings,** in any quantity. State average size, quantity and price required, to Aylen, 38, Sun Street, London, E.C.2.

**Wanted Aircraft Sheet Metal Work,** also radiators of every description. Highly skilled and experienced.—Box No. 3463, THE AEROPLANE, 166, Piccadilly, W.1.

**Required immediately, Gnome engines and spare parts of same.** Must be in first-class condition. Spot cash paid.—Ruffy, Arnell, and Baumann Aviation Co., Ltd., Noel Road, Acton, W.3.

### ENGINEERING.

**British School of Aeronautics.**—Aircraft Engineering Course; Aero Design; Aero Construction; Aero Draughtsmanship; Mechanical Engineering.—Pennington's, 254, Oxford Road, Manchester.

### MODELS.

**Model Aeroplane,** flies  $\frac{1}{4}$  mile circular flight, carriage paid, 3s. 4d. "I can thoroughly recommend your machines." Testimonials from Dr. Adams, Union Road, Sheffield. Thousands satisfied, testimonials from all parts.—Dept. C., Bristol Model Aeroplane Depot, Eastville, Bristol.

**T. W. K. Clarke and Co., Ltd.,** Model Department, Hampton Wick.—Though we are full up with full-size aeroplane parts orders, we still build models as we did in 1906. Sopwith Biplanes, etc., in Stock.—Send 3 stamps for our illustrated List, 120 items and 14 models; certain metal goods are out of stock.

**Model Motors.**—First-class  $\frac{1}{2}$ -h.p. Motors, air or water-cooled, castings, with cylinder-bored valves bored, crank-cases spigotted, spark-plug tapped, valve box machined out; instructive. See list price, 2d. Catalogue—Gas, Oil, Petrol Motors—2d.—Littleover Motors, Derby.

### BOOKS

**By Lieut. Victor W. Page of the U.S. Air Service.**  
**JUST PUBLISHED.**

**AVIATION ENGINES.** Their Design, Construction, Operation, and Repair. A book for the Student, Engineer, and all interested in Aviation, by a recognised authority. Giving practical instruction on repair and maintenance not to be found elsewhere. Medium 8vo. 580 pages, with over 240 very distinctive and specially made Engravings.

Price Net 15s.

**GLOSSARY OF AVIATION TERMS** in English-French and French-English. Crown 8vo. 100 pages, with Plates and Illustrations.

Price Net 5s.

**AN AVIATION CHART.** A large Wall Chart, showing a typical Aeroplane Power Plant in Part Section, with all important components shown. Folding to Pocket Size.

Price Net 2s. 6d.

London: **CROSBY LOCKWOOD & SON**  
7 Stationers' Hall Court, E.C.4.

**FULL UP NOW  
WITH WAR WORK**

but inviting your enquiries

for  
**After War  
Requirements**

**RANSOME & MARLES BEARING CO. LTD.**  
NEWARK-ON-TRENT



### WANTED

**Wanted Woodwork** for aeroplanes, very large up-to-date factory, fully equipped with latest machines; any class of aircraft work undertaken; prompt deliveries; best work.—Apply Box 3030, THE AEROPLANE, 166, Piccadilly, W.1

**Engineering Firm** with well-equipped machine shops, now engaged on munitions, solicits inquiries for all classes of turning, drilling, grinding, milling, fitting, etc. Aircraft fittings, also copper pipe work, a speciality. Correspondence with a view to post-war business especially invited.—The Lankester Engineering Co., 20, Eden Street, Kingston.



## MISCELLANEOUS ADVERTISEMENTS.

**SPECIAL PREPAID RATE:** 18 words 1/6; Situations Wanted ONLY, 18 words 1/-; 1d. per word after. **TRADE ADVERTISEMENTS** in these columns, 3 lines 3/-; 10d. per line after. Public Announcements, Legal Notices, Auctions, Contracts, etc., 16 per line. For the convenience of Advertisers, replies can be received at the offices of "THE AEROPLANE" 166, Piccadilly, London, W.1.

## PATENTS.

**PAGE & ROWLINSON**, Chartered Patent Agents (Consulting Engineer, Mr. S. E. Page, A.M.Inst.C.E.), 27, Chancery Lane, London, W.C. Tel. 332 Central.

**Henry Skerrett**, Chartered Patent Agent, 24, Temple Row, Birmingham.—Patents, trade marks, and designs.

**Inventors advised free.** Write for booklet.—King's Patent Agency, Ltd., 165, Queen Victoria Street, London. 30 years' references. **Stanley, Popplewell and Co.**, Patent Agents and Consulting Engineers. Applications for Patents attended to in all countries.—38, Chancery Lane, W.C. Telephone: 1763 Central. Circular free.

## SITUATIONS VACANT.

**A Large Firm**, London, N.W., has several vacancies for aeroplane erectors and assemblers, used to accurate and high-class aeroplane work. No one living more than 10 miles away or engaged on Government work need write to Box 3360, THE AEROPLANE, 166, Piccadilly, W.1.

**Aeroplane Draughtsmen.**—Wanted by old established aeroplane manufacturers several first-class draughtsmen, with previous experience of aeronautical work preferred.—Apply, with full particulars of qualifications and salary required, to your nearest Employment Exchange, mentioning this paper and No. A4697. Men on Government work need not apply.

**Several Good Engineering Draughtsmen** required by large controlled firm in Tyne district, manufacturing aircraft. Experience of aeronautical work desirable, but not essential. Good remuneration offered to competent men. No one on Government work need apply.—Write, stating age, experience, and qualifications, to your nearest Employment Exchange, mentioning this paper and No. 443.

**Draughtsmen**—Jig and Tool—wanted for high-class aero engine repetition work. Must have good machine shop and some drawing experience. Good salary and overtime pay for keen, practical, and intelligent men. No juniors need apply. Persons already employed on Government work will not be engaged.—Apply to nearest Employment Exchange, mentioning this paper and No. A4882.

**An Estimating Clerk** required. Must have some technical knowledge and accustomed to deal with aircraft details. No one resident more than 10 miles away or engaged on Government work need apply.—Palladium Auto-Car Co., Ltd., Felsham Road, Putney, S.W.

**First Class Spindle Hand** required. Top rate of pay. No one resident more than 10 miles away or engaged on Government work need apply.—Super Aviation Co., Ltd., Buddingfield Lane, Dollis Hill, Willesden, N.W.

**Required, at once, Press Tool Makers**, open and Pillar tools, one hour from London, rate with bonus 2s. per hour; Sundays, double time. No person already engaged on Government work will be engaged.—Applications must be made through your nearest Employment Exchange, mentioning this paper and No. 3467.

**Efficiency Engineer** required immediately for Government controlled establishment situated in the Eastern counties. Only men of sound experience who can show successful results need apply. No one already on Government work can be engaged.—Applications must be made through your nearest Employment Exchange, stating age and salary required, mentioning this paper and No. 3466.

**Wanted Chemist** with practical works experience of the manufacture of Dopes to take charge of new plant. Good prospects for suitable man.—Write fully, stating experience, age, and qualifications to Box 3466, THE AEROPLANE, 166, Piccadilly, W.1.

## RADIATOR AND SHEET METAL WORK UNION WORKMEN (BEST RATES PAID) WANTED

No one already on Government work  
or resident more than ten miles away,  
will be engaged.

Apply—

**GALLAY RADIATOR CO., LTD.**  
198, Gt. Portland Street, W.3

## SITUATIONS WANTED.

**Works Manager**, or position of trust, 37, practical engineer, invaluable experience both aeroplanes and seaplanes. Tactful, energetic, methodical organiser, accustomed to latest service methods and capable of economically increasing production.—Box 3284, THE AEROPLANE, 166, Piccadilly, W.1.

**Advertiser**, with experience of aircraft workshops, possessing good commercial knowledge, wishes to take up some position in Aircraft Factory (preferably in the Midlands) where contracts are being carried out; could invest a little capital if desired.—Apply Box No. 3476, THE AEROPLANE, 166, Piccadilly, W.1.

**Buyer**, excellent connections, wide experience Purchase and General Management aircraft production, needs change. Firms with opening for keen business man write particulars of scope and wages.—Box No. 3475, THE AEROPLANE, 166, Piccadilly, W.1.

**Discharged Flying Officer** with British and Foreign decorations and Chartered Accountant with eight years' excellent varied experience and first class references and testimonials, desires responsible position in work of first national importance.—Box No. 3474, THE AEROPLANE, 166, Piccadilly, W.1.

**Engineer** (ineligible), sound practical man, with good technical knowledge (including chemistry) and experience in aeroplanes, desires appointment in this line. London district or South Coast preferred.—Box No. 3473, THE AEROPLANE, 166, Piccadilly, W.1.

**Qualified Man**, disengaged, with experience in aeroplane work, desires position as a draughtsman and designer. London or near London preferred.—Box No. 3471, THE AEROPLANE, 166, Piccadilly, W.1.

**Competent Mill Foreman**, disengaged, with first class aircraft experience and 20 years' practical experience on all Woodworking Machines. Excellent references; good organiser and timekeeper.—Box No. 3470, THE AEROPLANE, 166, Piccadilly, W.1.

**Young Man**, experienced in construction of aeroplane metal parts and fittings, requires position as Viewer. Army exemption.—Box No. 3460, THE AEROPLANE, 166, Piccadilly, W.1.

**As Foreman** of aircraft Sheet Metal and Panel Beating Department. Experience in all aeronautical Sheet Metal Work, including De H., Sopwith and latest H.P., etc. Excellent references; good organiser for output.—Box No. 3469, THE AEROPLANE, 166, Piccadilly, W.1.

**To Aircraft Manufacturers.**—Young gentleman, ineligible, opening up office in Birmingham desires to act as representative for first-class firms not in that district as outside production man. Thorough knowledge of markets and manufacture. Excellent references. District includes Coventry and Wolverhampton.—Box No. 3465, THE AEROPLANE, 166, Piccadilly, W.1.

**Works Manager** (37), Practical Aeronautical Engineer of exceptional business ability desires post. Guarantees to make your business a success, whatever the condition is now.—Box No. 3468, THE AEROPLANE, 166, Piccadilly, W.1.

**Advertiser** seeks berth as Foreman or similar position, of aero engine test, assembling, or tuning up. Expert knowledge on aircraft engines. Excellent references; production or experimental; invaluable experience.—Box No. 3461, THE AEROPLANE, 166, Piccadilly, W.1.

**Advertiser** seeks position as Foreman Erector, or Manager. First-class experience in assembling and erecting complete machines. Capable of economically increasing production.—Box No. 3462, THE AEROPLANE, 166, Piccadilly, W.1.

**Foreman Fitter** on aeroplane and seaplane fittings desires position as assistant manager or position of trust. Age 37. Practical engineer; tactful, energetic, methodical organiser. Provinces preferred.—Box No. 3459, THE AEROPLANE, 166, Piccadilly, W.1.

## AIRCRAFT PARTS.

**Hardwood for Aeroplanes.**—Specially Selected air-dried timber as supplied to leading constructors in Britain and the Continent. Silver Spruce, Ash, Poplar, Hickory and Ash Skids; Three-ply; Thin Cedar and Mahogany for Floats; Walnut for Propellers.—William Mallinson and Sons, Ltd., Hackney Road. Phone, 3845 Central, 4770 Wall.

**Tapes, Webs, Cords and Threads** in all qualities, suitable for Aircraft Work. Delivery from stock.—John MacLennan and Co., 30, Newgate Street, London, E.C.1. (See Advertisement Page 1201 and Buyers' Guide).

**Aeroplane Seats** to any drawing or specification. Prompt deliveries.—F. C. Chappell, Cane Works, 9, Fisher Street, Nottingham.


**Aeroplane Seats.** We can give quick delivery of cane seats, A.G.S. 264 or other patterns, guaranteed pass inspection. Write us for anything required in cane work.—The Willowbrook Company, Leicester.

## MISCELLANEOUS.

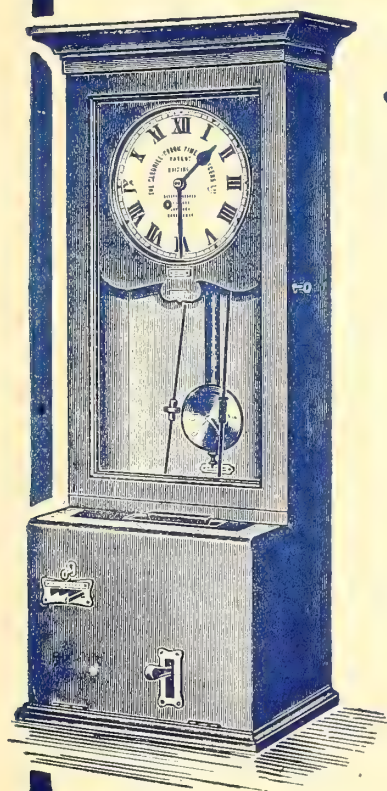
## MAKE MONEY BY WRITING.

**£50 PRIZE.** Send postage (2d.) for particulars and copy of "How to Earn Money while Learning How to write for Newspapers and Magazines." Practical and Comprehensive Correspondence Courses—Fiction and Articles, etc. Expert Literary Directors. Constructive Criticism. Beginners taught how to make work saleable. Exceptional testimonials. Address "Editorial" (Dept. E.M.), 22, Chancery Lane, London, W.C.2.





*Always up to time*



THE TIME STAMPED  
ON THE CARD...  
ALWAYS AGREES  
WITH THE CLOCK

A BRITISH MACHINE  
THROUGHOUT . . . . .  
ENSURES CORRECT  
ESTIMATES . . . . .

**THE GLEDHILL-BROOK TIME RECORDERS LTD**  
26 Victoria St LONDON, S.W. 44 Hill St BIRMINGHAM.  
43 MARKET St HUDDERSFIELD.



# WYCOMBE AIRCRAFT CONSTRUCTORS, LIMITED.

==  
HIGH WYCOMBE,  
BUCKS.  
==

Telephones : High Wycombe 84 (Stores : High Wycombe 120).  
Telegrams : "Aircraft, High Wycombe."

CONTRACTORS TO THE ADMIRALTY AND AIR COUNCIL.

# SHORT BROTHERS,

Aeroplane and Seaplane Works,  
ROCHESTER, KENT,  
— AND —  
Aircraft Works & Flying Grounds,  
— BEDFORD. —

Telephones :—

627 CHATHAM.  
261 AND 262 BEDFORD.  
788 BATTERSEA.



Telegraphic Addresses :

"SEAPLANES," ROCHESTER.  
"SHORTS," BEDFORD.  
"BALLOONING," LONDON.

London Office: WHITEHALL HOUSE, 29/30, CHARING CROSS, S.W. 1.  
Telephone: 378 REGENT.

Telegrams : "TESTED, PHONE, LONDON."

EDITORIAL AND ADVERTISEMENT OFFICES, 166, PICCADILLY, W.1.























